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E. W. BRABROOK, Esq., F.S.A., *Vice-President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From the AUTHOR.—The Right Hand: Lefthandedness. By Sir Daniel Wilson. 8vo. London, 1891, pp. x, 215.

—— The Evolution of Mind in Man. By Henry Benedict Medlicott. 8vo. London, 1892. pp. 48.

—— Sumpitan and Bow in Indonesia. By C. M. Pleyte, Wzn. 4to. Leiden, 1891. pp. 17. Plates.

—— Neue Beiträge zur Kenntniss des Nephrit und Jadeït. By A. B. Meyer. 4to. Berlin, 1891. pp. 42. Plates.

—— A Chat about the Aborigines of Tasmania; and some Notes on the Shell-Mounds at Little Swanport. By Alfred J. Taylor. 8vo. Hobart (1891). pp. 23.

—— Die Philippinen. By A. B. Meyer, and A. Schadenberg. Fol. Dresden, 1890. pp. 26. Illustrated.

From the PUBLISHERS.—Anthropological Religion. By F. Max Müller, K.M. 8vo. (Longman, Green, and Co.) London, 1892. pp. xxvii, 464.

—— Popular Tales of the West Highlands. Vol. iii. By J. F. Campbell. 8vo. (Alex. Gardner.) Paisley and London, 1892. pp. xiv, 440.

From the École d'Anthropologie de Paris.—Revue Mensuelle. 1892. No. 1.

From the India Office.—Epigraphia Indica and Record of the Archæological Survey of India. Vol. i. Part 8.

From the United States Geological Survey.—Bulletin. Nos. 62, 65, 67–81; Annual Report X (1888–89).

From the Académie des Sciences de Cracovie.—Bulletin Internationale, 1891. No. 10.

From the Académie Impériale des Sciences de St. Pétersbourg.—Mélanges Biologiques tirés du Bulletin de l'Académie Impériale des Sciences de St. Pétersbourg. Tome xiii. Liv. 1.

From the Kongl. Vitterhets Historie och Antiqvitets Akademien (Stockholm).—Antiqvarisk Tidskrift för Sverige. Del. viii, 3, 4; ix, 3; x, 6; xi, 4.

From the Royal Irish Academy (Dublin).—Transactions. Vol. xxix, 17.

From the Essex Field Club.—The Essex Naturalist. Vol. v. Nos. 7, 8, 9–11.

From the Editor.—L'Anthropologie. Tome ii. No. 6.

—— Bullettino di Paletnologia Italiana. Tom. vii. N. 8–10.

—— Internationales Archiv für Ethnographie. Band iv. Heft 6.

—— Nature. Nos. 1159–1162.

—— Revista Argentina de Historia Natural. Tom. i. Ent. 6.

—— Revue Scientifique. Tom. xlix. Nos. 2–6.

—— Science. Nos. 464–468.

—— The American Journal of Psychology. Vol. iv. No. 2.

From the Koninklijk Instituut voor de Taal-, Land-en Volkenkunde van Nederlandsch-Indië.—Bijdragen tot de Taal-, Land-en Volkenkunde van Nederlandsch-Indië. Deel vii. Afl. 1.

From the Berliner Gesellschaft für Anthropologie, Ethnologie und Urgeschichte.—Zeitschrift für Ethnologie. 1891. Heft 5.

From the Folk-Lore Society.—Folk-Lore. Vol. ii. No. 4.

From the Royal Geographical Society.—Proceedings. Vol. xiv. No. 1.

From the Royal Scottish Geographical Society.—The Scottish Geographical Magazine. Vol. viii. No. 2.

From the Royal Society.—Proceedings. Nos. 303, 304.

From the Royal Statistical Society.—Journal. Vol. liv. Parts 3, 4.

From the Société d'Anthropologie de Bruxelles.—Bulletin. Tom. ix.

From the Société d'Anthropologie de Paris.—Bulletins. 1891. Part 3.

From the Société Archéologique (Agram).—Viestnik hrvatskoga Arkeologičkoga Družtva. Godina xiv. Br. 1.

From the Society of Arts.—Journal. Nos. 2042–2046.

From the Society of Biblical Archæology.—Proceedings. Vol. xiv. Part 3.

Mr. M. J. WALHOUSE exhibited some articles and implements of every day use among the Chin Tribes, on the Burmese and Chinese Frontier.

Captain E. S. HASTINGS exhibited the Skull of a Chin Dacoit Leader, upon which Dr. GARSON made some remarks.

A paper on "The Exploration of Howe Hill Barrow, Duggleby, Yorkshire," by Mr. J. R. MORTIMER, was read by Dr. GARSON.

Dr. J. G. GARSON read a paper on "The Human Remains found in Howe Hill Barrow."

Mr. E. W. BRABROOK, Mr. R. B. HOLT, Mr. T. V. HOLMES, Mr. A. L. LEWIS, Mr. G. M. ATKINSON, and Mr. H. BALFOUR joined in the discussion, and the Author replied.

An ACCOUNT *of the* EXPLORATION *of* HOWE HILL BARROW, DUGGLEBY, YORKSHIRE.

Abstracted from a Paper by the Explorer, J. R. MORTIMER, of Driffield.[1]

THE large flat-topped circular Barrow known as "Howe Hill" stands on the hill-side, a short distance south-east of the village of Duggleby. It measures 125 feet in diameter at the base, 47 feet across the top, and 22 feet in height at the east, and 19 feet at the west side. The rising slope of the hill on which it stands is on the south side. It resembles in size and form two other barrows in the same neighbourhood, namely, "Muckle Head," 9 miles south-west of Duggleby at the foot of Garolly Hill, which has not been explored, and "Willy Howe," near Wold Newton, 11 miles east, which was examined by Lord Londesborough in 1857, and again in 1887 by Canon Greenwell, but on neither occasion were any human remains obtained from it. The Howe Hill Barrow was first opened by the Rev. Christopher Sykes in 1798, but there does not appear to be any account of the results obtained from it extant, and there is no tradition in the neighbourhood of anything having been found. During the summer of 1890, Mr. J. R. Mortimer was able to explore it, through the munificence of Sir Tatton Sykes, Bart., who supplied the funds necessary for the purpose.

[1] This paper is published in full, with five lithograph plates of the barrow and the various relicts it contained, in the "Proceedings of the Yorkshire Geological and Polytechnic Society," vol. xii, part 2, 1892, p. 215 *et seq.*

The plan adopted by Mr. Mortimer in his exploration was to open an area, over the centre of the barrow, 40 feet in diameter from north to south, and 77 feet from east to west, but narrowing towards the east to 27 feet.

In the upper 5 feet of soil removed from the centre of the area and chiefly in the filling-in earth from the former excavation the following articles were found; a few nails and flat pieces of iron (much corroded), one side of a pair of shears, the pointed end of a bone pin, a piece of bone apparently part of the side of an Anglo-Saxon comb, twenty-five flint flakes some of which were variously shaped by chipping, a punch-shaped tool 2½ inches long, a portion of a well-toothed double-edged flaked saw, and a very thin sharply pointed knife, 2 inches long, of light coloured native flint, the natural surface of which forms one side of the knife while the other side has been formed by removing four flakes. There was also found a large core of black flint from which four flakes had been struck, but as the grain of the flint is twisted, it had probably been rejected and subsequently used as a hammer; 250 potsherds, consisting of one small piece of British ware; some pieces of Roman and Anglo-Saxon vessels; several portions of vessels belonging to a more recent period, of which some were glazed others unglazed; several pieces of sand and grit stone, all more or less reddened by the action of fire. The following organic remains were found; the bones and fifteen teeth of horse in disturbed soil; five teeth of ox; part of the mandible of goat; two mandibles of a small kind of dog or fox; some teeth and portions of the antler of red deer. Some human remains were found here, consisting of the greater part of a mandible, and several portions of a large femur and of a small one, both of which had been deeply cut into, probably in the previous exploration.

As the exploration was carried to a depth of 9 feet from the top, it was found that the utmost limits of the previous excavation had been reached. There appeared to have been trenches dug in the form of a cross in the centre of the mound, such as have been found in other barrows in Yorkshire, but these did not extend quite to this depth. Two of the arms of the cross-like trenches which had not been undisturbed by the previous exploration contained pure clay, a brick-like piece of limestone, and a piece of grit-stone which seems to have had a circular hollow cut in the middle of it. This second section contained parts of two human skeletons, which had been previously disturbed; portions of skulls and other bones of two large dogs; portion of the hoof and some bones of an ox; four teeth of horse and two pieces of burnt bone. One portion of

the leg bone of the ox had a round hole, half an inch in diameter, bored through it. There was also a portion of an iron knife, apparently Anglo-Saxon, nine rusty nails and other pieces of iron; fifty-nine pieces of pottery of the same kind as previously found so abundantly in the upper 5 feet of soil removed; twelve chips of flint.

Hitherto the mound had consisted of roughly quarried chalk. At a depth of 9½ feet from the top surface of the barrow Kimmeridge clay was found. On further examination it was found that the Kimmeridge clay now met with formed the exterior layer of an inner mound, the vertex of which did not correspond with the centre of the upper surface of the completed mound, but was somewhat to the north of it. The inner mound enclosed by it was 75 feet in diameter and 11 feet high. The thickness of this layer of clay was one foot, and no relicts of any kind were found in it.

Below the layer of Kimmeridge clay the soil of the mound consisted of small chalk-grit, which was found to extend as a concentric layer 4½ feet thick over the core of the mound. In the lowest foot of this stratum, about the centre of the exploration (that is 14 feet from the top level of the barrow) were found seven cremated interments of burnt bones. The only relics found with these cremated interments were portions of two bone pins, a piece of the lip of a food vase, and a flint implement chipped to a very sharp point.

Below the chalk grit layer, clayey soil of a hazel colour mixed with a little chalk grit was reached, and was found to form the core of the barrow, the other layers being arranged concentrically over it. This core was 5½ feet high above the base level of the barrow and the surrounding ground. The cremated interments found in the chalk grit layer above were also abundant here, especially in the upper part of it; 3½ feet from the top level of this clay soil a human mandible nearly complete, with the last molar tooth just appearing above its formative socket, was found. In exploring the core of the barrow it was worked from east to west. The first unburnt human remains found were those of a child (marked A) and 10 inches below it lay on the right side the skeleton B of a youth with the knees drawn up and the head to the east. A femur and tibia of this skeleton measured 13 and 10½ inches respectively. The position in which it lay was 19½ feet from the top of the barrow and 1 foot above its base level. No relics were found with it, but about 2 feet to the south and 2 feet higher up in the mound was portion of a stag's horn, with the point broken off, and a similar specimen lay 1 foot higher and a little more to the south. In a shallow grave almost under the

skeleton B was found a skeleton (marked C) lying on the left side with the head north north-east, both hands near the head, and the knees drawn up at a right angle to the trunk. A femur of this body measured 16¾ inches and a tibia 13½ inches, both the right and left humerus measured 13 inches in length. A bone pin 9¼ inches long lay about 3 inches behind the back of the body with the point directed to the hips. A little behind the shoulders lay a number of flint flakes, worked flints, and several tusks of boar. A similar deposit lay a few inches behind the hips. Altogether there were thirteen flakes and six worked flints of dark colour, two incisor teeth of beaver and twelve boars' tusks, one of which appears to have been made into an instrument. A little above the body were found a cervical vertebra of an ox and other pieces of animal bones. On the western edge of this shallow grave was the skeleton of a very tall person with the head to the west and over a large centre grave, to be described presently, into which it had settled about 10 inches. The skeleton was resting on its right side, the knees drawn upwards. In front of the face lay a beautiful knife of almost transparent glass-coloured flint, ground down on both sides, the ends being rounded; it measures 2¾ inches in length and 1 3/16 in breadth. Over the central grave and about 3 feet above the base level of the barrow lay the skeleton of a child marked E, and about 2 feet under it another skeleton marked F was found, lying on the left side, with the head to the south-west, the knees drawn up and the hands on the front of the face. Two feet lower down, in the central grave, about 1 foot below the surface level was the skeleton marked G, lying on the right side in flexed position, with the head to the north-east. The skeleton was distorted as it lay, probably by the unequal settling of the grave below. In front of the head lay a hammer head made of the basal portion of a shed antler of red deer, and near it was a diamond shaped arrow head of dark flint with the point broken; there was also a beautiful axe of drab colored flint, such as might have been obtained from the neighbouring beds of chalk, 9½ inches long, lying with the broad cutting edge towards the knees of the skeleton. The hammer-head lay on its edge and evidently had been held in that position at the time of the interment by a shaft, probably of wood which has perished. This skeleton was very probably originally over the mouth of the central grave but in the course of time settled down into it, like the skull of the skeleton marked D.

On working down into the grave about 3 feet below the surface level, the flexed skeleton of a child (marked H) was found lying on the right side with the head to the east. This

body lay at the bottom of a boat-shaped mass of clay in the centre of the grave with chalk grit round it.

Two feet lower down, that is 5 feet below the surface level of the barrow was an adult skeleton (marked I) in a flexed position, considerably distorted, with the head to the east. Near the feet of this skeleton lay the cranium (marked J).

At a depth of 9 feet below the base level of the barrow the firm, undisturbed floor of the grave was reached. In shape the grave was widest at the top and gradually narrowed towards the bottom, where it measured 7 feet across from east to west, and 5½ feet from north to south; at about half its depth, if measured 11 feet between east and west and 10 feet between north and south. Resting on the bottom of the grave was the skeleton marked K in a recumbent position, the head to the east, the knees drawn up, the right arm across the chest and the hand on the left shoulder, the left arm flexed to a right angle across the abdomen and the hand near the right elbow. At the knees of the skeleton lay the crushed remains of a semi-globular vase made of dark-coloured Kimmeridge clay such as may be obtained in the neighbourhood. Near the vase nine small flint flakes were found some of which were notched on one edge as if intended for saws; there were also two cores from which a few flakes had been struck, a good deal of decayed wood, and several thin patches of ferruginous matter.

A little to the south of the grave, in the inner core of the barrow there were thirteen more deposits of burnt bones, with one of which was found a bone pin. At a level of 3 feet above that of the base of the barrow and near the south edge of the central grave were found the distorted remains of a skeleton (marked L) which had been placed with the head to the south, the knees drawn up, the right arm crossed over the body, the left doubled up and the hand brought to the shoulder. This body seems to have been interred with the head and shoulders considerably raised. The mandible was found a little distance below the head and some of the bones were displaced. A small deposit of cremated bones lay close to the hips of the skeleton. About 16 feet to the south-east of the centre of the large grave and 1 foot above the base level of the barrow lay the skeleton (marked M) on its back, the head to the south-west, the knees and head pressed over to the north-west. Over this skeleton were the remains of two very small children much decayed, but the exact position in which they lay could not be made out. About 20 feet west of these and 3 feet above the base of the barrow was found, in the core of the mound, most of the bones of the limb of a fox, determined to be such by Mr. Newton, of the Museum of Geology, Jermyn Street.

The total number of cremated interments found was fifty-three. No relics of any kind were interred with any of them, except in three instances, where portions of burnt bone pins were found, and there was no trace of any cinerary urns having been used. None of the cremated deposits exceeded 16 inches in diameter.

A DESCRIPTION *of the* SKELETONS *found in* HOWE HILL BARROW.

By J. G. GARSON, M.D.,

Corresp. Mem. Anthrop. Soc., Paris and Berlin; Lecturer on Comparative Anatomy, Charing Cross Hospital.

THE specimens from Howe Hill Barrow which have been placed in my hands for examination by Mr. J. R. Mortimer, of Driffield, consist of the skulls belonging to the skeletons he has designated in his paper on the exploration of the barrow, by the letters C, D, F, G, H, I, J, K, L, and M, and some of the long bones of the extremities of D, I, and K. He has also been good enough to furnish me with the measurements of some of the long bones, which have unfortunately not been preserved, belonging to C, D, G, I, L, and M, together with his notes and diagrams relating to the exploration of the barrow, which have been of the greatest assistance to me. The skulls and bones are in a very fragile condition, and many of the former are very incomplete, notwithstanding that Mr. Mortimer has bestowed much time and patience in restoring them as far as was possible.

Eight of the specimens belonged to adult males, and two to children of about six and ten years of age respectively. No female's bones appear to have been found in the barrow. According to the usual rule, the description of the specimens I am about to give will only include the adults of the series.

Stature.—As is generally the case with human remains from ancient barrows, the stature of the persons whom the skeletons represent can only be determined by calculation from the long bones of the extremities. Of these I have personally only measured the right femur of D, the right and left femora and tibiæ of I, and the two femora, the right humerus, and left tibia of K. The measurements of the other bones which I have given in the "Table of Measurements of the Long Bones" were made by Mr. Mortimer, on whose accuracy in measuring I must entirely rely. It is necessary to state that his measurements

were not made with instruments of such precision as were at my disposal for measuring those of the bones submitted to me, and although I have found some differences between his measurements and my own in the bones of D, I, and K, which we have both measured independently, I have little doubt that his measurements of the bones of the other skeletons which I have not measured, are sufficiently correct for comparison with measurements taken before such rigid accuracy as is now required was practised in anthropological research. The measurements made by Mr. Mortimer were supplied to me in inches and parts of inches, but for convenience I have carefully converted them into their equivalent in millimetres. By taking my own and Mr. Mortimer's measurements together I have been able to calculate the probable stature of seven of the adults, no long bones being found with the eighth adult skull (marked J). In doing this I have used the following formulæ given by Topinard in his "Éléments d'Anthropologie":—

$$\frac{\text{Femur} + \text{Tibia} \times 100}{49{\cdot}4}; \quad \frac{\text{Femur} \times 100}{27{\cdot}1}; \quad \frac{\text{Tibia} \times 100}{23{\cdot}3}; \quad \frac{\text{Humerus} \times 100}{20{\cdot}7};$$

As in my opinion the best and most reliable estimate of stature is obtained from the lengths of the femur and tibia added together, I attach most importance to the results yielded by the first of these formulæ. Having the measurements of both these bones in each of the seven skeletons, I have been able to estimate the stature in this way in each instance, and find that the average of the series is 1 m. 661, or 65·4 inches. Estimated from the length of the femur alone, the average is 11 mm. more, namely, 1 m. 672, or about 66 inches, while from the length of the tibia it is 1 m. 575, or about 62 inches. The tallest individual was that to whom the skeleton D belonged. His stature estimated from the femur and tibia is 1 m. 927, from the femur alone 1 m. 874, and from the tibia 1 m. 905, or 75·9, 73·8, and 75 inches respectively. It is fortunate that I am able to place before you the right femur of this skeleton and to demonstrate its length to you as 508 mm., otherwise you might think that there was some mistake regarding its measurement, on account of its being so unusually long. The two shortest skeletons are those marked C and L, each of which have an estimated stature from the femur and tibia of 1 m. 555, or 61·2 inches. From these figures it will be seen that there is a considerable degree of variation in this small series. The occurrence of D measuring 9 inches more than the tallest of the other six, without there being any skeleton correspondingly short, gives an erroneous idea of the average stature of the series. I have therefore had recourse to Mr. Galton's method

of arranging the different specimens according to their centesimal grades, by which means we get rid of the disturbing effects of the extremes at each end of the series, and so obtain the true mean of the group. When treated in this way the actual mean stature of the series is 1 m. 628 (64·1 inches). For the information of those who are acquainted with this method of dealing with statistics I may state that at the 25th centesimal grade the stature is 1 m. 564 (61·6 inches), the 50th, 1 m. 616, and at the 75th 1 m. 692 (66·6 inches); the value of Q, therefore, is 64 mm., giving a corrected mean for the series of 1 m. 628. This height indicates as nearly as possible, I consider, the mean stature of the persons represented by the skeletons we have to deal with. It is considerably lower than the mean stature of the male population of this country at the present time, which, at prime of life between the ages of 23 and 51 is 1 m. 715 (67·5 inches), according to the extensive observations of the Anthropometric Committee of the British Association[1] (*see* Reports for 1882).

The tibio-femoral index, which shows the relative length of the tibia to that of the femur, varies from 77·7 in G and M to 87·4 in D, and averages in the whole series 81·1, but excluding D, in which the index is very high, it averages 80 in the six other skeletons, which is almost the same as that given by Broca, Topinard, and Rollet for Europeans. Although in persons of tall stature Topinard found that the index is somewhat higher than in short persons (averaging 81·1 in males with statures between 1 m. 70 and 2 m. 06, and 79·7 in those with statures varying from 1 m. 43 to 1 m. 60) the index is so high in D as to lead us to suspect that some error has occurred in recording the length of the tibia in that skeleton.

The index of Platycnemism, or the relation between the transverse breadth of the tibia to its antero-posterior diameter was ascertained only in the two specimens K and I which were measured by me; in the former it is 64·9 and in the latter 67·6, giving an average of 66·3 for the two specimens. The measurements for this index were taken by Busk's method about 4 cm. below the nutrient foramen of the bone. The average index in English people is 73, so that the specimens from Howe Hill Barrow, are markedly platycnemic as compared with the existing inhabitants.

To trace the relations of the people represented by these skeletons it is necessary to study, as far as materials will permit, the characters and dimensions of those of the earlier races who have successively inhabited various parts of England.

[1] When these observations, as tabulated, are treated by Mr. Galton's method of centesimal grades, the corrected mean stature is 1 m. 703 (67 inches).

For this purpose I have calculated the stature of all the Barrow specimens of adult males described in the "Crania Britannica," by Dr. Barnard Davis. As, however, he only gives the dimensions of the femur, I have only been able to do so from it, and not from the femur and tibia, as I would have preferred to do. The results are as follows:—The average stature of eight Long Barrow skeletons is 1 m. 698 (66·8 inches), the average length of the femur being 460 mm., while that of twelve Round Barrow skeletons is 1 m. 793 (70·6 inches). Thus between the average stature, estimated from the femur, of the Howe Hill series, which I have previously stated, is 1 m., 672, and that of the Long Barrow specimens, the difference is only 26 mm.; while between the former and Round Barrow series it is 118 mm. It is therefore clear that the skeletons from Howe Hill correspond very closely to Dr. Barnard Davis's Long Barrow series, which, I may mention, includes specimens from Yorkshire, Staffordshire, Gloucestershire, and Wiltshire, from which counties also the Round Barrow specimens were likewise obtained. The tallest Long Barrow skeleton in the "Crania Britannica" series has an estimated stature of 1 m. 874, his femur being 508 mm. long, which is exactly the same length as the longest femur from Howe Hill; the shortest man has an estimated stature of 1 m. 546, which is also exactly the same as that of the shortest skeleton from Howe Hill. The range of variation in stature of both series is practically the same; in both there is a disturbing element owing to the presence of an unusually tall individual, which raises the average stature of each group to a figure higher than it should be. To get at the true mean stature of the groups I have again employed Mr. Galton's graphic method, which shows that the stature at the 25th and 75th centesimal grades is respectively 1 m. 585 and 1 m. 715 in the Howe Hill specimens, and 1 m. 652 and 1 m. 730 in the Long Barrow series, the respective values of Q (*i.e.*, half the difference between the statures at each of these two grades), are 65 and 39 mm., giving to the former series a corrected mean stature at the 50th grade of 1 m. 650, and the latter of 1 m. 691, the observed mean of the former being 1 m. 653, and of the latter 1 m. 702. On the other hand the tallest Round Barrow skeleton in the "Crania Britannica" has an estimated stature of 1 m. 920 (75·6 inches), and the shortest of 1 m. 686 (66·3 inches) while the rest of the series range themselves regularly between these extremes.

In the "Memoirs of the Anthropological Society of London," vol. iii, p. 41, Dr. Thurnam gives the length of the femur of twenty-five males from Long Barrows as 457 mm. which gives an estimated stature of 1 m. 686, while the femur in twenty-seven

males from Round Barrows averaged 477·5 which gives an average stature in them of 1 m. 761.

The Howe Hill specimens may also be compared with skeletons obtained by General Pitt Rivers from Rotherley, Woodcuts, and Winklebury. The medium stature of eleven skeletons found at Rotherley was 1 m. 562 (61·5 inches), and of seven from Woodcuts which were rather more mixed in type, 1 m. 644 (64·7 inches). The general conformation of the skulls obtained from these two places agrees with that of the Howe Hill series in being, as we shall afterwards see, markedly dolichocephalic. On the other hand the medium stature of twelve Anglo-Saxon skeletons from Winklebury was 1 m. 700. Thus we see that the stature of the Howe Hill Barrow series agrees very closely with that of the dolichocephalic race in the Pitt Rivers series, and is considerably less than that of the Anglo-Saxons in the same collection. The tibiæ of the Rotherley specimens are somewhat platycnemic, the average index in these being 70·2.

SKULL—*Characters of the Calvarial portion.*—The ridges for muscular attachments on the cranial vault are of very moderate size, but in one or two instances are fairly well developed in the stephanic region. The under surface, however, presents a marked contrast to the upper in this respect, the superior curved line of the occiput being in some cases very strongly developed; a well marked torus is present in three specimens and a smaller one on a fourth, the other muscular attachments on the base are well marked except the mastoid processes which are only moderately large. The bones forming the calvarial vault are thick and heavy and in one instance might be called massive. The sutures are moderately closed in some specimens and obliterated in others; stenosis of the sagittal suture is present in a greater or less degree in the majority of cases. Where the sutures can be traced their character is simple. In only one instance are wormean bones present, these are of small size and situated in the lambdoidal suture. The antero-posterior outline or curve of the calvaria is regular; in one case the forehead is vertical, in several it is low, and in others its curve is medium. Occipital elongation occurs only once, and in that instance it is probably more apparent than real, owing to post-mortem distortion. I may mention here that post-mortem distortion of some kind is noticeable in almost all the specimens, but varies in character, sometimes affecting the right and sometimes the left side. When viewed from above, the outline of the calvaria is seen to vary considerably; in four cases it may be described as extremely long and narrow, the forehead rounded, narrow, and with the orbital processes little marked;

the sides straight and the occiput elongated; in three specimens it is somewhat shorter and broader, and more or less pear-shaped in form or, as it has been termed by some writers, "coffin-shaped." In one of these latter (L) the forehead is very rounded, the frontal bosses are well marked, and the occipital region terminates very abruptly, so as to give a truncated appearance to the back of the head. The fourth specimen (G) presents characters intermediate between these two kinds; it agrees with the first four in being long and narrow, but in the details of its outline it agrees with the second three. When the skulls are placed in a row and viewed from the front, the form of the arch of the cranial vault is observed to be very characteristic, being pointed in the first four specimens, while it is flat in the other four. These varieties in the form of the cranial arch is equally observable when the skulls are looked at from behind. As the differences mentioned seem to me to be no mere accidental variations but probably racial, I have divided the series into two groups, the first of which is composed of the specimens C, D, I, and K, while the second includes G, L, J, and M. It will be noted that the skull of the primary interment belongs to the first group. The immature specimens F and H belong to the second group.

On each parietal bone of J, just above the parietal boss, a rounded opening occurs, that on the left side being 35 mm., and that on the right 20 mm. in diameter, the edges are bevelled inwards, and from them stellate fracture rays extend. There is little doubt that these holes are the result of sharp and quick blows delivered with considerable force, and would have been sufficient to have caused the death of the person. The skull was found by itself without the rest of the skeleton in the middle of the grave below the centre of the barrow.

Characters of the facial portion.—The broken condition of the facial portion of the skull renders it impossible to give anything like a satisfactory description of the characters of the face, but it appears to be longer in proportion to its breadth in the first group than in the second. As a rule the facial bones harmonise with those of the calvaria, except in L, in which the weakness of the former presents a marked contrast to the massiveness of the latter.

The glabella and superciliary regions vary from being almost quite flat in some specimens to being moderately or even markedly developed in others. In the case where it is most developed (I), the superciliary bosses and the glabella form a continuous ridge across the forehead. The orbits appear to be set at about the same angle with the horizontal in each case, and their upper margins are thin; in form they are

broadened rectangular to nearly square in the specimens complete enough to admit of their shape being determined.

The nasal spine is small, the lower margins of the nasal openings are sharp and well-defined, the outline in profile of the nasal bones appears to vary within the outlines of Nos. 1, 2, and 3 of Broca's nasal curve. The profile of the upper jaw is straight or nearly so, there is therefore no tendency to prognatism. The direction of the incisor teeth is vertical. In the majority of cases the teeth are moderately worn, but in one case (I) they are much worn, and in two (K and J), they are little worn. The last molar is sometimes absent through not being developed. The form of the palate or rather the outline of the upper alveolar arch is somewhat parabolic. The chin is narrow and pointed in the majority of cases, but it is more rounded and less pointed in M.

Measurements.—Turning to the measurements of the skull and comparing them, as far as possible, with the characters observed by inspection, we find that while some of these do not vary much in the two groups, others are markedly different. The measurements of G show that in some respects it agrees with those of the first group, but in the majority it resembles those of the second, among which it has been placed from its general characters.

The cephalic index of the series ranges from 65·5 to 79·6; five of the crania are hyperdolichocephalic, one is dolichocephalic, and two are mesaticephalic. All of the specimens belonging to the first group, and G, belonging to the second group, are hyperdolichocephalic. The higher cephalic index in the other specimens is due not only to their breadth being greater, but also to their length being less than those of the first group. The cephalic index of L being considerably higher than the others (79·6) is probably due to irregular or premature closure of some of the sutures, which has caused abnormal bulging of the parietal regions, its biauricular or base breadth being only 100 mm., or no less than 20 mm. less than any of the other specimens, so that it cannot be considered quite normal.

The height measurement and the height to length index are slightly less in the first group than in the second. The appearance of greater height imparted to the eye in the former is therefore due to the want of filling out of their lateral walls, and the acuteness of the arch formed by the upper and curved parts of the parietal bones, as it will be seen that there is little variation in the biauricular diameter in the whole series, except in L, which is unusually narrow in this region. Only in K does the height exceed the maximum breadth. Owing to the

imperfect condition of the specimens it was not possible to measure the cranial capacity, but as estimated from the cephalic module of Schmidt it is a little larger in the second group than in the first, though the antero-posterior or sagittal, the horizontal, and the traverse circumferences of the cranium are practically similar in both groups.

The narrowness of the cranium in the first group is not confined to the maximum breadth only, but extends to the minimum, and the maximum (bistephanic) diameters of the frontal bone, and also to the external biorbital and bizygomatic diameters, all of which are less than in the second group. This shows that the upper part of the face is quite in harmony with the width of the calvaria in each group. The minimum traverse diameter of the maxillary bones, that is, the maximum alveolar breadth, is if anything less in the second group than in the first, while the bigonial diameter of the mandible averages 6 mm. less in the former, showing that the lower part of the face is narrower in them than in the latter, thus reversing the conditions present in the upper part of the cranium. This narrowing of the lower part of the face in the second group appears more accentuated on account of the greater breadth of the upper part, and gives a somewhat wedge-shaped appearance to the face. Details of the characters of the nose, orbits, &c., from the measurements is unfortunately impossible.

The skulls are in all respects similar to those of Long Barrow specimens which have passed through my hands from different parts of the kingdom, but I have never examined a series of skulls in which there were such a large proportion of hyperdolichocephalic specimens. The two types found in this series I have long been familiar with among Long Barrow skulls. That which I have distinguished as group 2 may be thought from the description to be somewhat like the skulls of the Round Barrow period, but this is not the case, as although somewhat coffin-shaped they are quite distinct from them. It is very unfortunate that in the exploration of this barrow the importance of preserving most carefully every bone of each skeleton found was not understood, as the anatomy of the two types which existed in that remote period has not been worked out yet. As far as I am able to see, there does not seem to be any difference in stature between the two groups, nor was there apparently any preference as to the place of interment given to the one type more than the other; both were thoroughly mixed together, some of each group were in the grave with the primary interment, and some of both kinds were found outside it.

Let us now turn to the skulls from Long Barrow described in the "Crania Britannica" and by Dr. Thurnam in the "Memoirs of

the Anthropological Society of London," vol. iii, and to the specimens figured by General Pitt Rivers from Rotherley and Woodcuts. The cephalic index of 17 Long Barrow skulls, including the nine specimens whose height has been estimated from the femur previously discussed, from the "Crania Britannica" series, varies from 67 to 75; three are hyperdolichocephalic, 13 dolichocephalic, and 1 mesaticephalic. The measurement of length from which Dr. Davis calculated the index was that from the ophryon to the occiput which generally is a little shorter than the maximum length measured from the glabella, as now universally done, consequently the cephalic index calculated from the former is somewhat higher, and it is probable that several of the 13 dolichocephalic specimens would have fallen within the limits of the first group had Dr. Davis measured their length from the glabella, many of them having indices according to him of 70, 71, and 72. In a more recent paper Dr. Thurnam[1] gives the cephalic index of 48 Long Barrow skulls as varying from 65 to 75. Of these 16 are hyperdolichocephalic, 29 dolichocephalic, and 3 mesaticephalic; their length averaged 195, the breadth 139 mm., the height 143, the face length (probably from the ophryon to the chin) 111 mm., face breadth 128 mm.; the cephalic index of the series averages 71 and the altitudinal index 73. Coming to the same race in post-Roman times we find that the cephalic index in the specimens from Rotherley varied from 68·9 to 82·6; and that 3 were hyperdolichocephalic, 6 dolichocephalic, 3 mesaticephalic, and 1 brachycephalic. The Woodcuts specimens are not so markedly dolichocephalic and not so pure in character.

Arranged in tabular form, the cephalic index in these series are as follows:—

	Hyperdolichocoph.	Dolichoceph.	Mesaticeph.	Brachyceph.
Howe Hill Barrow	5	1	2	0
Long Barrows "Cran. Brit."	3	13	1	0
" " Dr. Thurnam.	16	29	3	0
Rotherley, Gen. Pitt Rivers.	3	6	3	1
Woodcuts	0	5	7	1

From this it is evident that the general form of the Howe Hill Round Barrow skulls agrees entirely with the Long Barrow skulls of Davis and Thurnam. In neither group of the Howe Hill barrow skulls, if we except L, which as I have already said is an abnormal specimen, have we any approach towards the brachycephalic type. The only other mesaticephalic specimen, J,

[1] "Memoirs Anthrop. Soc. Lond.," vol. iii, p. 41.

is at the lowest end of the group, only ·4 above the dolichocephalic group. As it is very imperfect in the posterior part of the base, and as it is shorter than any of the others, it is not unlikely that in drying, the unsupported part of the occipital may have curved inwards somewhat and so reduced the length. If this be the case, which I think is very probable, it would also fall into the dolichocephalic group.

I have not been able to compare these specimens from Howe Hill with any of the actual specimens described by Drs. Davis and Thurnam, but I have done so with drawings of them. On plate 33 of the "Crania Britannica" is an engraving and on the opposite page of the letter-press are some woodcuts of a skull which has a cephalic index of 68·0 from Long Lowe Barrow in Staffordshire, and on Plate 50 is an engraving of a skull from West Kennet Barrow in Wiltshire of which the cephalic index is 67·0; both of these specimens resemble the skull C from Howe Hill. Again on Plate 59 we have an engraving of a skull from the Long Barrow of Rodmarton, Gloucestershire, with a cephalic of 72 which agrees in its characters with M of our series. The skull depicted on Plate 5 from the Long Barrow of Ulley, Gloucestershire, fairly represents D, I, and K of our series. In the "Crania Britannica," therefore, we have specimens from the Long Barrows which represent very accurately both groups of our series from Howe Hill Barrow. I need scarcely occupy time in comparing them with the Round Barrow skulls described by Drs. Davis and Thurnam, as these are all brachycephalic and of very different type, except in cases where crossing or mixture has occurred.

Having established the fact, sufficiently clearly I hope, of the identity as regards the physical characters of the Howe Hill specimens with the Long Barrow race, there remains to be considered the question of the Archæological evidence of their affinities. For this we have to refer to the abstract of Mr. Mortimer's notes which I made previously to examining the skeletons, so as to do away with the chance of any bias being produced on my mind by the specimens. In the outer layer of the barrow we find flint, bone, and *iron* implements; British, Roman, and Anglo-Saxon pottery, and some of more recent date; of animals remains those of dog, red deer, ox, and horse. There were well marked traces of this outer layer having been used for secondary interments, but neither these nor the various explorations which had been previously made had extended beyond this layer. Next there is a layer of Kimmeridge clay 1 foot in thickness in which no relicts were found, which as it were cemented in the interior mound containing the interments which may be considered as the *raison d'être* of the

barrow. This inner mound consisted of two layers in the outer of which were found 7 deposits of burnt bones, with flint and bone implements and piece of a food vase. In the inner or core of the barrow were numerous cremated deposits extending to half its thickness, but fewer in number below that. Towards the base line of the barrow and in the central grave we have the skeletons placed in different directions chiefly lying on one or other side with the limbs drawn up towards the body. With them were found flint implements carefully manufactured, worked flints, and flakes, bone pins, some of which were burnt. With K, the primary interment at the bottom of the grave, was a semi-globular vase of Kimmeridge clay, but no cinerary urns were anywhere found; the animal remains found in connection with the skeletons were those of fox (identified as such by Mr. Newton), ox, deer, boar, and beaver. It is a matter of regret that the pieces of bones from the cremated deposits, so numerous in the barrow, were not preserved, as it might have been possible to determine from them whether they were human or belonged to domestic or other animals. From these data I think we have undoubtedly to deal with the remains of a Neolithic people interred in an age before metal had been introduced among them. The bronze age which succeeded the stone period is to tally unrepresented in the barrow, from which I think we may conclude that a considerable interval of time elapsed between the primary interments in the inner mound and the secondary ones in the outer layer. Although the various flints and other articles found have not, as far as I am aware, been submitted to the examination of a well-known acknowledged expert, the full description which Mr. Mortimer has given us of them leads me to the conclusion that the Archæological evidence corroborates the conclusions I have arrived at from my examination of the skeletons, and shows that the people interred in this Round Barrow are identical with the Long Barrow people.

In conclusion I should like to point out the advantage it would be if, when local explorations of ancient barrows are about to be undertaken, intimation thereof was given to the Council of this Institute in order that the matter might be referred to the Committee of Aid, of which General Pitt Rivers is Chairman, not for the purpose of taking the matter or credit out of the hands of local authorities, but for drawing their attention to the various points to be noted during the course of the work and giving them hints which would be valuable as to how the exploration could best be conducted. Had this been followed in the exploration of Howe Hill Barrow much valuable information would probably have been gained, which has

inadvertently been lost, and the money spent in the work would have been laid out to greater advantage.

NOTE.—Since this paper was written I have calculated the stature of the skeletons by Rollet's formulæ for the *femur* and *tibia*, which have been prepared after very careful measurements of these bones in persons whose height was known prior to their skeletons having been disarticulated. The stature from the *humerus* is calculated from Topinard's latest formula for that bone.[1]

	Humerus × 100. 20·0	Femur × 100. 27·3	Tibia × 100. 22·0	Fem. & Tib. × 100. 49·3	Average from H. F. & T.
C ..	1,650	1,556	1,559	1,558	1,588
D ..	—	1,861	2,018	1,931	—
I ..	—	1,608	1,577	1,594	—
K ..	1,710	1,707	1,700	1,703	1,706
G ..	—	1,677	1,618	1,651	—
L ..	—	1,535	1,586	1,558	—
M ..	1,625	1,677	1,618	1,651	1,640
	4,985	11,621	11,676	11,646	4,934
	1,662	1,660	1,668	1,664	1,645
	Average excluding D.				
	1,662	1,627	1,610	1,619	

As the length of the tibia in D is quite out of proportion to that of the femur, and gives an excessive height to the individual by the above formula, I think that some error has occurred in recording its measurement. The above formulæ appear to give better results than the earlier ones of Topinard used in the paper, as the estimates from the femur and tibia more closely correspond to one another. The earlier formulæ are those used by General Pitt Rivers in his works on "Excavations in Cranborne Chase;" the formulæ used in the paper for the estimate of stature from the lengths of the femur and tibia added together is almost the same as that just given, and the difference between using the one or other is only 3 mm. on the indicated stature, that is to say, when the divisor 49·4 is used the stature indicated by the answer is 3 mm. greater than when 49·3 is used as the divisor.

The length of the humerus in these specimens being greater proportionately than usual, is possibly to be accounted for from the longest bone having been measured instead of the mean

[1] Topinard, "L'Homme dans la Nature," 1891, p. 112.

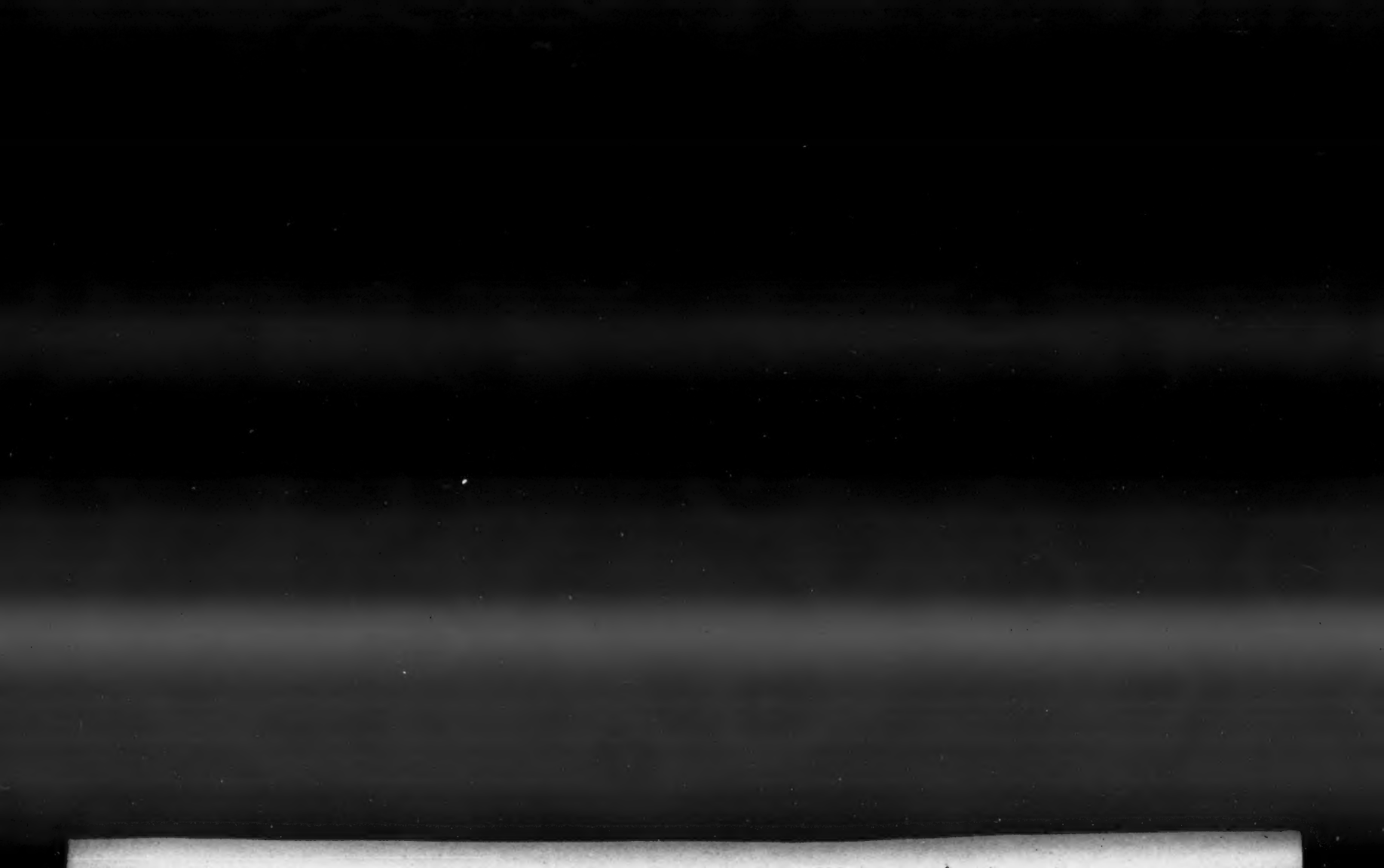
of the right and left having been taken. Topinard's last formula has been given in this additional note in preference to that of Rollet's which would have given a still higher estimate, and therefore differed more from the results given by the other bones.

Discussion.

The Chairman asked to be informed whether the dilapidated condition of the skulls was to be inferred to injuries caused by the pressure of a great superincumbent mass of about 30 feet depth upon them, or to injuries received during life; and whether the superficial cross-shaped excavations might not be due to some earlier exploration. He also offered some remarks on the evidence afforded by these discoveries in contradiction of the anciently-accepted maxim which associated long barrows with long skulls, and round barrows with round skulls, and on the circumstance of so large a number of interments by cremation being found without any cinerary urns.

Mr. T. V. Holmes said that he would like to make a few remarks from a geological point of view. The barrow was situated on the Chalk Wolds, and the material composing it was almost entirely either chalk or the "clay-with-flints" common on the surface in a chalk district, the insoluble residue left on the dissolution of the chalk at the surface through the action of rain water. But, in addition, there was, between nine and ten feet from the surface of the barrow, a layer of one foot of Kimeridge clay. Now, this must have been brought from some distance—Kimeridge clay being a formation below the chalk—for some definite purpose; and he could only suppose that it had been placed where it appeared with the view of preserving the remains below from the destructive action of rain. The skulls, &c., exhibited, which were not enclosed in any kind of receptacle, probably owed much of their good condition to the presence of this Kimeridge clay, and it was a fortunate thing that the early explorers had not pierced through that stratum. He did not remember having read of anything similar in accounts of the exploration of barrows, and should be glad to know if Dr. Garson, or any other member present, had known or read of other cases resembling this.

Mr. A. L. Lewis said the occurrence of soil brought from a distance was very frequent in burial mounds, and a covering of clay to keep the wet out was not altogether a new feature.



	Maximum length.	Maximum breadth.	Basio-brymatic height.	Minimum frontal breadth.	Stephanic breadth.	Frontal curve length.	Parietal curve length.	Occipital curve length.	Antero-post. curve length (nasion to opisthion).	Length of foramen magnum.	Basio-nasial length.	Total longitudinal circumference.	Horizontal circumference.	Auriculo-brymatic curve length.	Bi-auricular breadth.	Nasio-mental length.	Nasio-alveolar length.	Basio-alveolar length.
C	200	133	—	100	118	145	140	113	398	—	—	—	536	315	*c*110	120	70	—
D	202	139	132	87	*c*116	132	147	130	409	—	—	—	540	314	118	—	—	—
I	194	132	—	94	*c*111	132	127	—	—	—	—	—	*c*500	*c*290	*c*116	130	73	—
K	198	131	135	—	—	sutures obliterated.			371	41	114	526	531	312	121	96	—	—
Total	794	535	267	281	345	409	414	243	1,178	41	114	526	2,107	1,231	465	346	143	—
Average ..	198·5	133·7	133·5	93·7	115	136·3	138	121·5	383	41	114	526	527	310·2	116·2	115·3	71·5	—
G	205	142	140	106	122	133	145	123	401	—	—	—	555	311	120	124	75	—
J	186	140	—	100	*c*120	*260		—	—	—	—	—	*c*513	—	—	—	—	—
L	191	152	140	103	125	143	146	114	394	—	—	—	549	341	100	—	—	—
M	194	145	133	100	129	126	139	114	379	42	103	523	540	309	121	114	64	97
Total	776	579	413	409	496	402	430	351	1,174	42	103	523	2,157	961	341	238	139	97
Average ..	194	144·7	137·7	102·2	124	134	143	117	391	42	103	523	539	310	113·7	119	69·5	97

c means *about* and the measurements to which it is attached are approximate only, owing to the specimen being so imperfect as to prevent the actual dimension being m

MEASUREMENTS OF THE LONG BONES, AND STATURE ESTI

	Humerus.	Femur.	Tibia.	F. and T.	From humer
C	330	425	343	768	1,594
D	—	*508*r*	444	952	—
I	—	‡*439	*347	*786	—
K	*342*r*	§*466	*374*l*	*840	1,652
G	—	458	356	814	—
L	—	419	349	768	—
M	325	458	356	814	1,570
Total	997	3,173	2,569	5,742	4,816
Average	332	453	367	820	1,605

* Means measured by myself: when only one bone has been measured it is marked *r* or *l* as it was right

† The relation which the length of the tibia bears to that of the femur shows that probably some error femoral index of the six specimens, omitting D, is 80·0.

‡ Femur, *r* 438, *l* 440; Tibia, *r* 348, *l* 346.

§ Femur, *r* 467, *l* 463 worn. All measurements of long bones unmarked with * have been supplied to m

Basio-alveolar length.	External bi-orbital breadth.	Bizygomatic breadth.	Maximum breadth of maxillæ.	Minimum breadth of maxillæ.	Bigonial breadth.	Interorbital breadth.	Orbital breadth.	Orbital height.	Nasal length.	Nasal breadth.	Palato-maxillary length.	Indices. Cephalic.	Height.	Sup. facial.	Total facial.	Nasal.	Stephano-zygomatic.	Gnathic.	Orbital.
—	104	124	88	60	104	—	—	33	*c*50	*c*23	53	65·5	—	56·4	{103·3‡ 96·8}	46·9	95·2	—	—
—	—	—	—	—	—	—	—	—	—	—	—	68·8	*c*6·3	—	—	—	—	—	—
—	101	*c*123	102	60	*c*100	26	38	33	54	*c*25	54	68·0	—	—	—	46·3	85·9	—	86·8
—	—	—	—	60	103	—	—	—	—	—	—	66·2	6[illegible]·2	—	—	—	—	—	—
—	205	252	190	180	307	26	38	66	104	48	107	268·5	133·5	56·4	96·8	93·2	181·1	—	86·8
—	102·5	126	95	60	103·3	23	38	33	52	24	53·5	67·1	66·7	56·4	†96·8	46·6	90·5	—	86·8
—	114	132	—	61	98	—	—	—	56	*c*22	—	69·3	68·3	56·8	{106·4 93·9}	39·3	92·4	—	—
—	*c*116	—	—	57	—	—	—	—	—	—	—	75·3	—	—	—	—	—	—	—
—	*c*102	—	—	54	88	—	—	—	—	*c*23	—	79·6	*c*73·3	—	—	—	—	—	—
97	109	134	100	63	105	*c*23	40	33	52	24	54	74·7	68·6	47 8	{117·5 85·1}	46·2	96·3	94·2	82·5
97	441	266	100	235	291	23	40	33	108	69	54	298·9	210·2	104 6	179·0	85·5	188·7	94·2	82·5
97	110·2	133	100	59	97	23	40	33	54	23	54	74·7	70·0	52·3	89·5	42·7	94·3	94·2	82·5

on being made. * Fronto parietal curve length. ‡ When the nasio mental length is the divisor. † When the Bizygomatic breadth is the divisor.

RE ESTIMATED FROM THEM BY FORMULÆ STATED IN PAPER.

om humerus.	From femur.	From tibia.	From F. and T.	Average from F. T. and H.	Tibio-femoral Index.
1,594	1,568	1,472	1,555	1,545	80·7
—	1,874	1,905	1,927	—	†87·4
—	1,620	1,489	1,591	—	79·0
1,652	1,719	1,605	1,700	1,659	80·2
—	1,690	1,528	1,648	—	77·7
—	1.546	1,498	1,555	—	84·9
1,570	1,690	1,528	1,648	1,596	77·7
4,816	11,707	11,025	11,624	4,800	5,676
1,605	1,672	1,575	1,661	1,600	81·1

was right or left.
me error has occurred in measuring, or recording the measurement of the tibia in D. The average tibio-

pplied to me by Mr. Mortimer.

FEBRUARY 23RD, 1892.

F. W. RUDLER, Esq., *Vice-President, in the Chair.*

The Minutes of the last meeting were read and signed.

The election of DENNIS E. SAMUEL, Esq., of 3, Kensington Palace Gardens, was announced.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From the AUTHOR.—Mission Scientifique du Cap Horn. 1882–1883. Tom. vii, Anthropologie, Ethnographie. By P. Hydes and J. Deniker. 4to. Paris, 1891. pp. viii, 424. Illustrated.

—— The Chinese, their Present and Future: Medical, Political, and Social. By Robert Coltman, junr., M.D. 8vo. Philadelphia and London, 1891. pp. viii, 212. Plates.

—— A few Tusayan Pictographs. By J. Walter Fewkes. 8vo. 1891. pp. 18.

—— Da Deficienti ad Idioti. By A. Zuccarelli. 8vo. Napoli, 1891. pp. 48.

—— Some Observations on the Havesu-Pai Indians. By R. W. Shufeldt, M.D. 8vo. Washington, 1891. pp. 4. Plates.

—— The Navajo Belt-Weaver. By R. W. Shufeldt, M.D. 8vo. Washington, 1891. pp. 3. Plate.

From the DELEGATES OF THE CLARENDON PRESS.—A Primer of the Gothic Language. By Joseph Wright, Ph.D. 8vo. Oxford, 1892. pp. xii, 247.

—— The Philology of the English Tongue. 5th Edition. By John Earle, M.A. 8vo. Oxford, 1892. pp. xvi, 744.

From the PUBLISHERS.—Chinese Characteristics. By Arthur H. Smith. 8vo. (Kegan, Paul, Trench, Trübner, and Co.) London, 1892. pp. ii, 428, ii.

—— Evolution, Astronomy, Food, Physiology, &c. By William Durham, F.R.S.E. 8vo. (A. and C. Black.) London and Edinburgh, 1891. pp. 127, 133, 123.

—— Egyptian Science. By V. E. Johnson, B.A. 8vo. (Griffith, Farran and Co.) London (1891). pp. xx, 198.

—— Collections for a Lexicon in Luganda and English and English and Luganda. By the Rev. Philip O'Flaherty. 8vo. (S.P.C.K.) London, n.d. pp. (ii) 41.

From the SECRETARY OF STATE FOR THE COLONIES.—Annual Report on British New Guinea from July 1st, 1890, to June 30th, 1891. Fol. Brisbane, 1892. pp. 149. Plate and maps.

From the ÉCOLE D'ANTHROPOLOGIE DE PARIS.—Revue Mensuelle. 1892. No. 2.
From the EDITOR.—Nature. Nos. 1163, 1164.
—— Revue Scientifique. Tom. xlix, Nos. 7, 8.
From the NIEDERLAUSITZER GESELLSCHAFT FÜR ANTHROPOLOGIE UND URGESCHICHTE.—Mittheilungen. Band ii. Heft 3.
From the ROYAL SOCIETY OF VICTORIA.—Proceedings. Vol. iii. Transactions. Vol. ii. Part 1. Vol. iii. Part 1.
From the SOCIEDADE CARLOS RIBEIRO.—Revista de Sciencias Naturaes e Sociaes. Vol. ii. No. 7.
From the SOCIEDADE DE GEOGRAPHIA DE LISBOA.—Boletim. 10A Serie. Nos. 1-3.
From the SOCIÉTÉ IMPÉRIALE DES NATURALISTES DE MOSCOU.—Bulletin. 1891. Nos. 2 and 3.
From the SOCIETY OF ARTS.—Journal. Nos. 2047, 2048.

Mr. H. LING ROTH read a paper on "The Superstitions, Burial, and other Customs of the Natives of Borneo. Part II. (Edited from the papers of the late H. BROOKE LOW)."

Mr. F. W. RUDLER, Mr. A. L. LEWIS, and Mr. G. M. ATKINSON took part in the discussion.

The NATIVES *of* BORNEO. Edited from the Papers of the late BROOKE LOW, Esq., by H. LING ROTH.

II. LAND TENURE AND CULTIVATION; HABITATIONS; SLAVES; DRESS, PERSONAL ORNAMENT AND FASHIONABLE DEFORMITY; HUNTING; FISHING; NAVIGATION; WEAPONS AND WAR-DRESS; AGGRESSIVE WARFARE; DEFENSIVE WARFARE, HEADS; CAPTIVES; CANNIBALISM; MUSICAL INSTRUMENTS AND SINGING.

1.—*Land Tenure and Cultivation.*

As regards the tenure by which land is held, it has been the immemorial custom that when a person fells the virgin forest, he acquires by that act a perpetual title to the land. It is his from henceforth to do with as he pleases; he may sell it, or lend it, or let it. The rent he is empowered to demand may not exceed in value a dollar, and must be either a game-cock, or a sucking-pig, or a couple of plates. But as land is rising in value every year, and old jungle is becoming scarcer and scarcer, there is a

marked tendency among the tribes to demand a heavier rent—in fact several dollars a year. The tenure, too, has been modified within late years in view of the increasing demand for accommodation, and it is now generally understood that when the proprietor chooses to leave the district and remove into a distant country he forfeits, by so doing, all title to the ground and can no longer exact rent.

Agriculture with the Sea Dyaks is in a very backward condition, but they contrast very favourably with the Malay population in the vicinity. Neither use the plough nor buffalo, but the former cultivate on a more extensive scale and with a more provident idea. They grow, both individually and collectively, far more than they require for their own consumption, and with the residue they purchase necessaries, such as salt, steel, iron, and luxuries, such as personal ornaments, for their families. If the harvest has been really plentiful they are even able to afford to purchase gongs and toddy, and perhaps a jar or two.

As a rule they prefer to cultivate hilly soil, but some few have learnt to utilize the wet land. Their farming operations are regulated by the position in the heavens of the Seven Stars of the Pleiades. They commence business towards the end of the dry season, July and August, so that they have the wet monsoon to bring the paddy to maturity, and the beginning of the following fine weather, April and May, to ripen the grain.

The old jungle is called *kampong*, and the new is called *temuda*. The Dyaks prefer infinitely to farm the former whenever it is to be obtained within reasonable distance of the village, and when it is getting scarce in their immediate neighbourhood, they shift their residence nearer to it. In parts of the country more populous than others, it frequently happens that the Dyaks have not in their territory any old jungle; such situations are not so laborious to prepare, but being destitute of the rich layer of vegetable mould and the fertilizing properties of burnt wood, are not nearly so productive. After having felled the old jungle and farmed on it once, they leave it for seven years to grow up again and are then ready to use it a second time. The first year's growth is called *kruaoh*.

When it is intended to open out new country, the first thing to be done is for every family to select an eligible piece of forest land and to mark out the quantity they wish to cultivate. The next step is to *beburong*, that is to say to consult the omen birds of the tribe to learn whether or no they approve of this choice. For this purpose they erect a hut first in one quarter then in another of the land in question, and wait upon the birds for

three days in succession until they hear either a note of warning to keep away from it, or a note of encouragement to remain on it. If the auguries are favourable they proceed to denude the land of its forest. Both sexes share in this labour; the women and boys clear away the undergrowth and the men fell the trees. Much valuable timber is then destroyed, as they spare only such fruit trees as are in full bearing, and those upon which the bees settle and from which they expect to be able to gather wild honey. As some of the trees are of enormous girth being furnished with buttresses, they do not always fell them at the base, but more often some distance up the trunk; others they leave standing altogether, merely lopping off the boughs to feed the fire which is afterwards to lay bare the ground and manure the soil.

When the land has been fully cleared it is left to dry. Sun and wind are now of almost vital consequence to the Dyaks, for if they are unable to thoroughly burn this immense mass of timber, famine stares them in the face for the year to come. If it pour with rain day after day and week after week, and there is no promise of continued fine weather, they are apt to imagine that some impurity has defiled the tribe and that the face of the Great Spirit is hid from them. So the elders of the people get to work to find it out, and adjudicate on all cases of incest and bigamy, and purify the earth with the blood of pigs. Prayers are offered to *Betara* from one end of the country to the other; for the space of three days the villages are tabued, and all labour is discontinued; the inhabitants remain at home, and strangers are not admitted. But if the weather is warm and dry the farms are ready in a very few days for the burning. They are set on fire from the windward side when the breeze is blowing, and soon the entire mass is seething with flames. It is a magnificent spectacle to behold when several of these farms are ablaze at once, and the hills are flaring like volcanoes. The heat at this season caused by the universal burning is almost insupportable; for days not a glimpse is to be caught of the blue sky overhead; the smoke hangs over the country like a heavy cloud, and the sun glows through the fog like a globe of molten copper.

When the fire has exhausted itself and the ground is again cool, which it soon is from the frequency of rain in this country, they commence to sow the seed. The men traverse the farm with dibblers in their hands and dibble the ground; the women follow and drop in the paddy seed and cover up the holes by scraping earth into them with their feet. Indian corn (*lingkau*) is planted sparingly at the same time; and as it is ripe and off the ground within three months from the date of the sowing, it does not

injure the paddy, amongst the rows of which it is sown; and as it comes in at a season when the rice with some is getting exhausted, and the second crop is not ready, it is of great use to the Dyaks, though not so much esteemed as rice as an article of food. On the larger collection of ashes they also sow the seeds of gourds (*gerrok*), pumpkins (*entekai*), a kind of melon without flavour (*junggat, kundu*), and cucumbers (*rampu*), of which they are very fond. These trail along the ground amongst the stems of the paddy, to which they appear to do no injury, and continue bearing for some time after the rice-crop has been gathered in. A small quantity of *pulut* is also grown by every family. It is a fine strong growing kind of paddy, but when cleaned and boiled is of a peculiar clammy nature. It bears a higher price than any other kind in the market, and is always eaten by the Dyaks cooked in green bamboos, as it is thought that the ordinary metal cooking pot spoils the flavour. The farm is tabued during the *tugal.*

After the seed has been sown, it is the business of the men to plant a fence (*raja*) round the farm to protect it from the inroads of wild animals such as pig and deer; this should not occupy much time, as the material is ready to hand, having been collected for the purpose previous to the burning, from the *débris* scattered on the ground.

There are many things which sorely try the patience of the Dyaks as they watch with unflagging interest the growth of their crops. It is true the pigs and deer are excluded by means of the wooden fence, but nothing short of the most untiring vigilance, and not always even that, can keep out the numerous climbing and winged pests, such as monkeys, squirrels, rats, and sparrows, some of which are sure to visit the farm as the paddy is ripening. Their sole remedy, such as it is, is to give a feast and propitiate the spirits in the usual manner. A miniature junk is built and filled with delicate morsels, the plagues are then besought to embark for some other country, and the toy is set adrift to float out to sea with the outward tide. During this ceremony the village is tabued for seven days in the same manner as is done when the purification for burning is performed.

The next thing is to build a *langkau* or farm house on some commanding or central situation where the family may reside without inconvenience off and on or altogether just as they please until the harvest is over. They have still weary duties to perform before they can hope to reap the fruit of their toil; but it too often happens that these are left to the women and children, while the able-bodied men seek other and more congenial occupation, *i.e.*, either follow a war-path, or journey

into the far interior, or plunge into the jungle in quest of its produce.

As a rule the women have to do all the weeding (*mantun*) by themselves; this is a very laborious task, as the weeds grow so rapidly as to threaten to choke the paddy unless promptly removed. Another grievance is the grass, originally called *rumput teka*, but since nicknamed *rumput blanda*, and which they declare was introduced by the whites to feed their cattle on. It is now a proverbial saying with them that it is impossible to get rid of this grass, likewise is it unprofitable to shake off the rule of the white man.

As the paddy begins to ripen, the men return to their homes and the families remove entirely to their farms, where there is plenty to do to scare away the birds and other pests and to prepare for the harvest. The paths intersecting the farm are closed at this season, and no one can traverse them without paying a penalty or sin-offering of a fowl and a bit of iron. Those who may be suffering from positive want, having exhausted their last year's stock, now glean of the half ripe paddy as much as they require for their immediate necessities; this is called *ñumbar*.

But when the paddy is fully ripe they all turn out, men and women, boys and girls, with knives and baskets and pluck the ripe ears with a few inches of stalk; these are then carried home and put out to dry, after which they are thrown into an enormous sieve suspended from the roof of the house, and threshed by the action of the feet, the grains falling through on to a mat placed underneath on purpose to receive them. After thorough drying in the sun, they are put in tubs made of bark (*tibang*) and stowed away in the loft or else housed in a hut, built on purpose for them hard by the village, the posts of which are furnished with wooden discs immediately below the flooring to prevent the rats from entering. The Dyak method of pounding the paddy to free it from the husk by means of pestle and mortar is injurious to the grain. By it the hard outer skin which protects it from the weevil is broken and this insect soon takes advantage of the circumstance to attack and destroy it. In the husk or paddy state the rice can be kept for years without injury.

The Punans and Kajamans farm meagrely; they prefer the sago to rice and grow the palm.

2. *Habitations.*

A Sea Dyak village is a terrace upon posts varying in length according to the number of houses of which it is composed, and

as the various houses are built according to a single scale and measurement and by a combination of labour, they rarely fail to present a uniform and regular appearance.[1]

There is always a ladder at either end of the terrace by which to ascend and sometimes one or more towards the centre of the *tanju* or open air-platform. The roof is thatched throughout with the same material—shingles or palm leaves—if the latter the *nipa* (*daun apong*) leaves are used where procurable, and where not (*daunbira*) the *pandanus*. The flooring in some villages is made of palm trees split into laths (*nibong* = wild varieties of the *areca*); in other cases of cane or bamboo or even twigs. The laths of split bamboo allow a delicious current of air to permeate the apartment. The outer walls are of plank, the inner of bark. No nails are used, the beams or rafters are lashed together with rattans or secured by wooden pegs. The posts are innumerable and of hard wood. The village is surrounded at its base by a wooden palisade which is itself protected by *chevaux de frise* of pointed bamboo. The village is divided by a plank walling into two main portions, the front and the rear. The former partakes of the nature of a very wide verandah and is open throughout its entire length. The latter occupies the rear of the entire building and is sub-divided into apartments, one for each family. Between the plank wall and the edge of the *ruai* is the *tempuan* or footway, a narrow passage running through the centre so that a person may walk from one end of the village to the other without encountering any obstacles.

Every family thus possesses a compact little residence to themselves comprising a *bilieh* or room where they can enjoy privacy when they like, a *tempuan* or thoroughfare where they pound their rice and pile up their firewood, a *ruai* or verandah where they receive visitors, a *tanju* or open-air platform where they air their things and lounge in the cool of the evening, and a *sadau* or loft where they keep their tools and store their paddy.

The *bilieh* or private apartment is furnished with a swinging door which opens outwards and is closed by means of a heavy weight suspended to a thong to the inside. The door can be secured when required by means of a bar. If the room be unusually large, it may have two doors for the sake of convenience. Figures are sometimes carved or painted on the door—saurians among others, grotesque images of supernatural beings, and indecent caricatures of the human person. There is no window such as we understand, but a portion of the roof is so constructed that it can be raised a foot or two by means of a stick to let

[1] Kĕñah houses are packed close together and there are originally three in a row without any intermediate space. The floor is only four feet from the ground, and any one can jump in.

out the smoke or to admit the fresh air. If the neighbours are near relations or intimate friends, as is often the case, a hole is cut in the wall which separates the room to avoid the necessity of a roundabout way into one anothers' apartments, and some villages are so arranged that one can traverse the entire length of the rear section of the building by means of these apertures without appearing on the verandah at all. There is no furniture in the room—none in fact being required. The floor is the occupiers' table and they squat to their meals. But there are plenty of mats to sit upon and baskets to pack their clothes in. Their cups and plates are hung in rows upon the walls as much for ornament as for use. Their valuables, such as old jars, gongs, etc., are ranged on three sides so as to present the most imposing appearance of wealth.

But the room is stuffy and untidy, and no wonder, seeing that there is but one for each family and this one is used as a kitchen as well as a mess room, as a nursery as well as a bed chamber. There can be no absolute privacy unless the door is barred to exclude the neighbours. Boys and girls keep running in and out and the dogs are always on the watch in the *tempuan* to spring in whenever the door swings open. The floor is swept after a fashion but the room is never deserted, and the roof is simply black with soot. The refuse is thrown into the piggery and poultry yard, which occupies the area or waste space under the house. Very little stench, if any, reaches the apartment from the ground, as the floor is raised too high above it to be affected by it. The *dapur* or fire-place is the only real piece of furniture in the room. It is built either to the right or to the left of the door set up against the wall of the *tempuan* and resembles an open cupboard, the lowest shelf resting upon the floor and the upper shelves being of lattice work instead of plank. The former is boarded all round and filled with clay. This is the fireplace and it is furnished with a few stones between which the pots are set. The shelf immediately above the fire is set apart for smoking fish and meat, etc. The shelves above this again are filled with firewood which being thoroughly dried is ready for use. The women, who do all the cooking, have also to keep these shelves supplied from the pile in the *tempuan*. As the smoke from the wood fire is not conducted to the roof by means of a chimney it spreads itself throughout the loft and blackens the beams and rafters until it finds its way out by the open window.[1]

[1] Elsewhere B. L. says: "They make a *palan* or raised platform and under it light a fire and heap it with dry twigs and fill the platform with split wood for drying as *bekal* (firewood). From the fire they take brands for other fires. They drive three pegs into the ground and place *prion* (jar) on top, fill

The *tempuan* or general thoroughfare is between the *bilieh* and the *ruai*. It is three feet in width and is paved with wood. It is furnished with a ladder or notched stick by which to reach the loft, a family mortar where the women pound their paddy with wooden pestles to free it from the husk, and a pile or two of firewood reared by the men for use inside. This passage is also used by the women to winnow their rice in, feed their dogs, and attend to their chickens, and by the men to wash the dirt off their feet when they come home from their work. The wall of the *tempuan* is sometimes elaborately painted in various patterns, and the spears of the family are thrust into the skirting board so as to be handy.

The *ruai* or verandah is in front of the *tempuan* and is as nearly as possible the same size as the *bilieh* from which it differs principally in being open on all sides and without any partition. It is therefore a cooler and more agreeable place and as such is frequented by both sexes for the purposes of conversation, discussion, and indoor pursuits. Female visitors are usually received in the *bilieh*, but male visitors are invariably received in the *ruai* and only enter the bilieh when invited to do so to be introduced to the women and to share the meals. They sleep in the *ruai* along with the boys and bachelors, and sit there all day when they have nothing better to do, conversing with the head of the family and chewing betel. The floor is carpeted with thick and heavy mats of cane interlaced with narrow strips of beaten bark. Over these are spread other mats of thinner and finer texture. There is a small fireplace between this and the next *ruai* for the men to warm themselves at when they get up, as they usually do, in the chill of the morning, before the sun has risen above the trees; the fire is allowed to go out in the middle of the day, but is revived towards the evening when it is getting dark, but still too early to light the torches.

Some *ruais* are provided with a *panggan* or bedstead with plank sides in one corner of the room for the men to sleep in, but this is not always the case. If the head of the family has made it for his own use and if he be a chief or rich man he will fix his gongs of various kinds around it for the sake of show; his weapons will be within reach and his war dress will hang from the roof where it can be seen to best advantage —a skull cap of wickerwork with its nodding plumes, and a skin jacket decorated with the tail feathers of the war bird of the tribe. But the most valuable ornament in the *ruai* by far is

quarter with rice and fill up with water and when it simmers cover it with leaves. Before the arrival of Europeans the Dyaks used earthen *prions* made by themselves."

of course the bunch of human heads which hangs over the fireplace like a bunch of fruit; these are the heads obtained on various warpaths by various members of the family, dead and living, and are handed down from father to son as the most precious heir-looms, more precious even than the ancient jars which they prize so highly. The next ornament of paramount importance is the bag of charms which is fastened to the centrepost and which is in like manner handed down from generation to generation and about which there is a great to do if any of the charms are lost or stolen.[1] Other posts are often adorned with trophies of the chase, horns and such like of deer and wild cattle and the heads of animals such as bears, monkeys, and crocodiles killed by the young boys. The empty sheaths of the swords and knives of the family are suspended on wooden hooks, while the naked blades are placed in racks above their heads.

The *tanju* or open-air platform is in front of the *ruai* and is railed at the edge, but the rail is often so slight that it is unsafe to lean against it. The flooring is usually of ironwood the better to stand exposure to the weather. It is used as a lounge in the evening, the view from it being extensive and the breeze refreshing. While the sun is shining the paddy is put out to dry as are the clothes and a variety of other things. The family whetstone and dye vat are kept here under the eaves of the roof.

The *sadau* or loft is used to stow away the baskets and agricultural instruments during the season they are not in use. The paddy is stowed away here in tubs of bark and also the seed for next year's farm.[2] Young women often sleep here and so do the young men and boys who are unprovided with curtains when the mosquitoes and sandflies are troublesome down below. They burn a fragrant bark to keep off the mosquitoes.

Whenever it is deemed expedient by the Sea Dyaks to shift from one locality to another, or to abandon an old habitation in favour of a new one, a general meeting is convened to consider the proposition and the desirability of the measure is fully discussed.[3] If a move be decided upon a few experienced men

[1] While on the Rejang river "a Kanowit gave me the tusk of a crocodile which devoured his sister, and showed me a boar's tusk which was lost to his family by an uncle who was killed by a Ukiet and to recover which he a few years ago killed the Ukiet. He showed me another tusk which was dropped by one of the boars which attacked and destroyed the house of an ancestor living at Lakut." Articles like these appear to constitute their charms.

[2] The Kyans, Kiñahs, and Lanahans stow their paddy in barns built for the purpose. The floor is six feet above the ground, and the posts are encircled with circular wooden discs to keep off the rats.

[3] The Kiñahs move away every few years so as to be always near heavy bush which they prefer for their farms.

are deputed to select a site and to report on its adaptability. If there be no reason to be dissatisfied with the choice, others are sent to hear whether the birds they venerate are for it or against it. Three days in succession they visit the spot and if the bird omens be favourable they proceed to work at once, and on the following morning the men turn out in a body with axes and choppers to hew down the jungle which is then left to dry. Another general meeting is thereupon convened to determine the question of the *tuah* or chieftainship, the measurement of the timbers, and the sequence of the rooms. It is customary to place the richest people in the centre of the village that they may exercise hospitality to all comers, and the boldest at either extremity so that they may defend the approaches if called upon to do so. The next move is to appoint an evening for the people to meet at the site of the new village. The ground is then cleared and measured out and pegs are put in where the posts are to stand. A piece of bamboo is then stuck in the ground, filled with water and the aperture covered with leaves, a spear and a shield are placed beside it, and the whole is surrounded by a rail. The rail is to protect the bamboo from being upset by wild animals and the weapons are to warn strangers not to touch it. If there is much evaporation by the morning the place is considered hot and unhealthy and is abandoned. Half-a-dozen people or so remain to keep watch and beat their tomtoms all night to frighten away evil spirits. Their friends return early in the morning and if all is well they set to and dig the holes, commencing with the chief's quarters and working simultaneously to left and right of him. Every family must kill a fowl or a pig before the holes can be dug, and the blood must be smeared on the feet and sprinkled on the posts to pacify *Pulang Gana* the tutelary deity of the earth. The posts must be planted firmly, for if one were to give way subsequently it would be regarded as a disastrous event and the house would be abandoned. All combine to labour collectively until the skeleton of the village is complete, and then every family turns its attention to its own apartments. When the building is sufficiently advanced to receive them they pack up their valuables and convey them by water if practicable, halting on the way until they obtain a favourable omen when they proceed rejoicing. Their valuables and cotton stuffs may not be moved into the house before themselves, they must be taken with them; this is required by custom. Before the village can be occupied a pig must be killed and its entrails examined and if the reading be unsatisfactory it is abandoned. After everything is settled a cup of *tuak* (toddy) is passed round.

When a family proposes to leave the village and remove else-

where it must give an *ensilan* (propitiatory gift ?) or be responsible for the consequences if a death ensue; a fowl, or a bit of iron, or a pig if the village be a large one is usually given.

When a person dies the floor of the room in which he died is changed.

In a Kiñah village the smithy is in a central situation. The Kiñahs smelt their own ore and manufacture their own iron ware. I watched the operation and procured a few samples of the metal. There is nothing peculiar to describe; there were an anvil, a couple of hammers, and a pair of twyers as usual, a charcoal furnace, a quantity of impure ore, and the usual primitive bellows. These people temper their own ore with a fragment of European ironware, when they can get it.

In front of a Lahanan village on the Rejang river there were four huge effigies, with the genital organs as usual fully developed; no indecency is intended, being merely relics of primitive worship [*sic*].

A fruit like an apple, called *buoh randau* by the Dyaks, is used to destroy vermin.

3. *Slaves.*

*Out*door slaves become so either by descent, by purchase, or by an amelioration of condition from having been *in*door slaves. *In*door slaves become so by purchase or descent. In cases where both parents have been *out*door slaves the *tabusan* (purchase or freedom money) is 40 reals (= $28·80), or one picul of guns, unless the child is of tender years, when the tabusan is 80 catties (= $21·60). In cases where one or both parents have been *in*door slaves, but have become *out*door slaves at marriage, the children are *out*door slaves.

When one parent is an *in*door slave and the other an *out*door slave, the children are divided between the owners of the parents, the first child following the condition of the father, supposing there be more than one child, *e.g.*: the father is *in*door slave of A, and the mother is *out*door slave of B; a child is born and sex being immaterial to the question, it becomes half *in*door slave of A and half *out*door slave of B. The *tabusan* of an indoor slave having been fixed by the practice of the courts at 60 reals (= $43·20), and that of an *out*door slave by descent at 40 reals, it will be clear that the *tabusan* on account of this first child to A is in this case 30 reals, and to B 20 reals, should the parents decide on purchasing the freedom of their child, subject, however, if very young to reductions as above. But when two children are born, the first becomes *in*door slave of A and the

second *out*door slave of B, the *tabusan* to A being 60 reals or 1½ piculs, and that to B 40 reals or 1 picul.

Where the parent is free on one side, and the other parent either an *in* or *out*door slave, the first child follows the fortunes of the father, the second that of the mother, and so on in succession, and this rule is unalterable. For example, a claim was lately made upon a boy, whose father was an *out*door slave, and whose mother was a free woman. The boy was third of a family of five and both parents were dead. The owner of the late father claimed this the third child, but the friends of the boy said that before the father died he had declared that the second child should be slave, and that the third child should be free, the second child being also dead. The court decided that the father had no right to alter the succession, and decided in favour of the plaintiff.[1] In cases where both parents are originally slaves, and after children are born one parent frees him or herself, the children born after the event follow the above rule.

In cases where an *in*door slave, man or woman, has become an *out*door one upon marriage, and has sought his or her own living, the children, so far as he or she is concerned become *out*door slaves, but he or she is still liable to pay his or her full *tabusan* to the master, no reduction being made unless the slave has become aged.

The owners of *out*door slaves have a right to demand the services of one child to work as *in*door slave until marriage, when he or she quits the master's house and returns to his or her position as an *out*door slave; if a girl the master is on no account to receive *barian* (purchase-money) from the husband, and if a boy the master must provide *barian*, or at least assist in the matter for the reason that the boy has hitherto worked for his master and has had no opportunity of acquiring property for himself. The above rule is seldom enforced by the owners. The owner of an *in*door slave, if the slave be a man, is expected to provide *barian* when the slave marries, and in such a case he becomes co-heir in the slave's property at death; if the slave be a woman, the owner receives the *barian*, and is still co-heir in case of death. In this case the husband generally prefers to pay the *tabusan* and to make his wife free. In no case whatever may an *out*door slave become an *in*door one except in the case of a child for a time as above.

It having come to the notice of the courts that in certain cases masters exacted as much work from an *out*door slave as from an

[1] Among the Punans the law seems a little different, the sex being of consequence; thus there was the case of a freeman who had married an indoor slave and a son and daughter were born. The son is free, following the condition of the father, the daughter is bond, following the condition of the mother.

*in*door slave, and that in other cases *out*door slaves could not be induced to do any work at all, a rule was made by which *out*-door slaves became liable to be called twice a year to work for their masters, twelve days on each occasion, failing which they would be subject to a month's hard labour on the roads. No *out*door slave is to be called upon to work out of his river's district.

The property of slaves is now strictly protected, it having been found that masters sometimes helped themselves as a right to their slaves' property. In a case lately settled at Oya, a widow, *in*door slave of a *pangeran* (high Malay official), possessed three sago plantations, and complained that her master had felled six trees, he having no land of his own. The *pangeran* pleaded that he only did what was customary; it was held, however, that he was wrong, and he was ordered to pay $9—the value of the trees and the costs of the suit.

The master of an *in*door slave becomes as above-stated co-heir with the slave's other relations in case of death if he has provided *barian*; if not, his position on this point is as the master of an *out*door slave. The master of an *out*door slave may become co-heir only when the slave has no children. No master can refuse permission to his slave to free him or herself, or his or her children, whether *in*door or *out*door, nor can he refuse permission to a slave to seek a new master, but he can complain to the courts if he has reason to think anyone has endeavoured to entice away his slave, and the person, if found guilty, would be heavily fined.

If a master seduces his slave she at once becomes free. There was a case in court where it was found that a master and his slave girl had lived as husband and wife for many years, and he had had children by her. The man died and his relations brought a case against the woman and her children to exclude them from the succession to the property of the deceased; but judgment was given in favour of the defendants on the ground that, though no marriage ceremony had ever been performed, the man and woman had been recognised by all their relations as husband and wife during the lifetime of the deceased.

The fine for bringing a slave into the country from foreign parts and selling him or her is $100, and the slave is to become free. There was a case where a man brought a family slave into the country, whose *tabusan* was three piculs, and as no permission had been given to the man to bring him here the slave was allowed to seek another master who had to pay one picul only to the previous master. There was another case where a man was allowed to bring a family slave from Brunei, he having first asked permission, and the slave himself having been questioned

by me at Brunei as to whether he liked to come here, and permission being obtained at the same time from the authorities at Brunei.

Where it can be proved that a master has not supported an *in*door slave, nor called upon him or her to work for five years, the slave is entitled to become free. The court would, however, be very careful about giving judgment in the case of *out*door slaves, they being very nearly independent. On one occasion one family brought a case into court against another and very numerous family, to compel the latter to pay the *tabusan* and become free, as the latter positively would not work when called upon, the defence being that they were already free, having been P. Dipa's slaves, who had been declared free. After a long investigation into their antecedents and genealogy, the case was given against the defendants, it having been found that since P. Dipa had left Maka none of the family had really worked for the plaintiffs, and that one of them had freed himself. An appeal was made to the then resident of the Third Division, but the previous judgment was confirmed, notwithstanding a letter from P. Dipa himself in favour of the defendants.

When *in*door slaves contract debts, if such debts be trifling, amounting to only a few dollars, the masters are expected to pay; when the debt is considerable, should the master pay it, the amount is added to the *tabusan*, for which the slave is already responsible. Should the master be unable or unwilling to pay, the slave is assigned to work for him until the debt is paid off at the rate of $2·50 a month. Slave debtors are unknown. When a freeman becomes hopelessly in debt, he is either imprisoned or assigned to his creditor to work off the debt as above, the creditor providing food and clothing; or the terms of his assignment may be that he sail in his creditor's *prahu* (boat) during the whole season—$7·00 a voyage being allowed to and from Kuching, or $12·00 a voyage to and from Singapore. During the close season the debtor must work in his creditor's house, and have such reductions made off his debt as may be agreed upon by the court. It has happened in a few cases that a relation has paid a man's debt and the man has been assigned to work for his relation until the debt is cleared off; no monthly diminution being allowed, but even in this case the term slave-debtors has not been used.

In the old days, according to the old Dyak laws, people who were careless enough to set a house on fire rendered themselves liable to become slaves to those who had been burnt out and this may have gone on for two or three generations, so that the grandchildren were slaves by birth. On one occasion the son of an old woman whilst smoke-drying some fish, fell asleep

through weariness. The fire caught the thatch and spread rapidly through the long Dyak house, melting the people's guns and cracking jars. A neighbour told the woman what had occurred, and she, forgetful of the altered state of things, at once gathered her children and said to them "Death is better than slavery," paddled with them to the Dyak graveyard, where she ate and gave the children to eat *tuba* root, and only one child survived to tell the story.

Every transfer of slaves must be made before the court.

For treatment of captives, *see* Warfare.

4. *Dress, Personal Ornament, and Fashionable Deformity.*

The ordinary male attire consists of a *sirat* or waistcloth, a *labong* or head-dress, and a *takai buriet* or seat mat; the full dress consists of the above with the addition of a *klambi* or jacket, and a *dangdong* or shawl.

The ornaments are *grunjong, langgu, tinggu, kongkong, rekong, simpai, tumpa, tinchien, ngkrimok* or *unus.*

The *sirat,* called *chawat* by the Malays, is a strip of cloth a yard wide, worn round the loins and in between the thighs so as to cover the *pudenda* and *perinæum*; it is generally six yards or so in length, but the younger men of the present generation use as much as twelve or fourteen yards (sometimes even more), which they twist and coil with great precision round and round their body until the waist and stomach are fully enveloped in its folds. It requires considerable practice to enable one to dispose of so much cloth gracefully about the person, but more time is spent by these young dandies of the forest than one would imagine, in order that they may appear to the best advantage; and the Ulu Ais seem to excel all other tribes in the skill and taste which they display in the disposal of this personal attire. One end is so arranged as to fall over the coils in front and dangle between the legs; the other is hitched up behind so as to hang at the back like a long tail, or is looped up at the hip to droop on the right thigh. The former plan is adopted where no *takai buriet* is worn so as to cover the hind-quarters as much as possible. A practised eye can tell in a moment to what tribe or section of a tribe an individual belongs, not merely by the length of his waistcloth and the way in which it is wound on, but also by its colour and the fashion in which it is decorated at its extremities. White, as being the plainest and most unpretending, is worn in mourning and during out-door labour; it is cheap and will wash. Dark blue, however, is the commonest throughout the country when out of mourning; it wears better, shows the dirt less, and is singularly becoming.

Both kinds are sometimes bordered at the edges with scarlet flannel. Prints and shawl patterns are affected by the young men of the Ulu Ai and Ngkari tribe; crimson, and saffron, and orange by the young of the Lamanaks and Sakarang tribes. A *klapong sirat*, or tail flap is often worn by the elder men of the latter tribes; it is of a dull white colour with a fringe to it, being made of home-grown cotton; it is prettily and fancifully embroidered with coloured thread and is sewn on to either end of the *sirat* to hang before and behind. The younger men and boys prefer the fringes, *kabu sirat*, manufactured by the Malays, or ornamental borders of coloured flannel.

The *labong*, or head-dress, is a piece of cloth a yard or two in length and wound round the head in the style of a turban, but so disposed that one end stands up straight from the forehead. But there are various ways of wearing, binding, coiling, &c., whereby one tribe may be distinguished from another. A white *labong* is frequently the sign of mourning. Saffron and orange are favourite colours among the Lamanaks and Ngkaris; black prevails among the Saribas settled in Kajulan. The Ulu Ais affect shawl patterns and *buntas*, and the Sakarangs of Gutabai use Javanese handkerchiefs edged with scarlet and yellow.

By others, young as well as old, a kind of cap called *selapok* is much worn. It is made of plaited rush or cane, sometimes coloured and sometimes plain, as well as coarse or fine; and is shaped either to fit closely to the skull or to resemble an ordinary square cap. Fillets or head-bands of the same material and variable quality are also worn with an open crown and bordered with scarlet cloth. Helmets of wickerwork are in vogue on the warpath and will be noticed in their place.

The Kiñahs wear bark cloth round their caps (as we wear crape round our hats) to show they are in mourning.

The *takai buriet* is a small mat which is tied round the waist with strings so as to cover the hind quarters and furnish the wearer with a clean portable seat at all times, and at all seasons. The mat is of split cane and woven into an endless variety of patterns and decorated in a variety of ways, use being made of coloured flannel, nassar shells, and European pearl buttons for this purpose. Sometimes a bear's skin or a panther's skin is cut to the required size and worn in lieu of a cane one, and when this is set off with the requisite beadwork of the country it forms a most handsome ornament to the person.

The *klambi*, or jacket (*baju*, in Malay) is manufactured from yarn spun from their own cotton. There are several kinds of these, but the one known as the *klambi burong* is considered the best. In all of them the sleeves are open in the armpit, and the pieces sewn together with twine. The edges are bordered

with scarlet cloth. There is another kind much worn by the Sakarangs which resembles a waistcoat more than a jacket, being without sleeves. The Ulu Ais manufacture a coarse white jacket striped with blue. The *klambi subang* manufactured by the Saribas is of finer and closer texture than any other, and is in consequence far more expensive. The thread of which it is wrought is procured from the Malays, and is of a red colour. The lower portion of the back is embroidered with gold and silver thread with a fringe of silk depending from it.

The *dandong* or shawl is worn slung over one shoulder.

The ornaments worn in the ear are various, some in the lobe and others in the outer cartilage. The former are called *langgu* and the latter *grunjong*. The *langgu* of the Ulu Ai is borrowed from the Punan, and consists of a small but heavy coil of brass or copper. The Lamanaks wear larger but lighter ones of lead. Boys sometimes wear a narrow strip of scarlet as a pendant to the ear or a wing of the golden green *chrysochroa* (? *buprestis*) beetle, so highly valued in India.

The *grunjong* is worn in the rim of the ear, which is pierced along its entire length to receive the numerous rings of which it is composed, and it looks uncommonly pretty on the person; but when it is discontinued for a time as it often is from choice or by necessity, as in mourning for instance, and the holes are plugged with wooden pegs to keep them open, the cartilage looks hideously ugly and disfigured by slits. The rings are of brass, and smallest at the top gradually increasing in size until they reach the bottom. A very great many are worn in each ear by the young and vain, while elderly men are content with fewer. The variety worn by the Ulu Ai and Ngkari are strung with white cowries, which are kept in their place by a ruby bead at either end of the line, and are heavier by far than the plain brass *grunjongs* used by the Sakarangs.

The *tinggu* is a pendant worn at each ear to droop on to the shoulder and is only worn by over-dressed dandies. It is decidedly ornamental, being made of thin crescent-shaped plates of brass stamped and fringed with metal.

A *simpai lengan* is an armlet, or as it is literally translated, a loop for the arm. It is worn above the elbow joint and is often of dark wood or carved ivory, but the kind most generally in use is formed from the base of the cone of the *kima* shell (*conus guratensis*), and is grooved on its upper surface. The cavity is filled up with resinous substance, and studded with the scarlet seed of the *michelia* or with a few nassar shells. It is a most becoming ornament but extremely expensive—

a pair of the largest and best, costing £6. Occasionally two are worn on each arm, but this is considered bad taste and is discouraged.

The *tumpa* or bracelets worn alike by men and women are of three descriptions, and are called *tumpa gelang, tumpa bala,* and *tumpa unus* respectively. The first are of brass, the second of ivory and the last of plaited fibre. The two first consist of some sixty close-fitting rings commencing at the wrist and reaching half way up the arm; a few in the former are made to hang loose on the back of the hand and being engraved are styled *tengkelai.*

The *tumpa bala* or *tumpa godieng* as they are also called, have been adopted by the Sea Dyaks within the last few years from the Tetaks and Segans; they are now made in china and gold in Bornean Bazaars.

The *tumpa unus* are only worn by young people too poor to afford any other kind; they are merely rings of plaited gomuti palm fibre worn in heavy masses on the wrist.

Kongkong rekong signifies "collar for the throat." Necklaces of European beads are worn by the young of both sexes; the ends are furnished with tassels of minute beads or bats' fangs. They are worn loose round the throat, and button in front, the tassels resting on the chest. Lamanak lads are fond of a large gold button as well as the tassel, but this is not universal even among their own tribe. Frequently several necklaces are worn, especially by the women. These necklaces of beads seem to have superseded the more savage necklaces of human teeth, etc., which were the fashion a generation ago, and is one proof of the civilising influence of the European government.

The *tinchian tunjok* are the rings worn on the fingers by both sexes. They are commonly made of brass, variously but rudely engraved, and are not soldered at the ends; other metals also are used but less frequently, such as copper, lead, tin. Gold and silver rings are procured from the Malays and used only by the tribes living in close proximity to them. Shell rings are less uncommon.

The *ngkrimoks* are hoops of cane worn immediately below the knee-joint, and covered with an infinity of diminutive brass rings. The hoops some eight or ten in number are strung together with coloured rattan to preserve a compact and regular appearance. The *ngkrimoks* are worn almost exclusively by tribes of Sakarang and Lamanak origin; the Ulu Ais and Ngkaris use the *unus* instead, and this consists of innumerable rings of plaited fibre worn in heavy masses, as many as 300 at a time upon each leg. The palm from which

the fibre leg rings is made, is called *apieng* by the Dyaks and *limak* by the Kyans.

The female attire is very simple, consisting of a *bidang* or short petticoat when at home, and a *klambi* or jacket when out of doors. By way of ornament the women wear in addition to the finger rings, necklaces, and bracelets which have already been described, other ornaments peculiar to their sex, styled *balong, tusok penchieng, tina, ranghi, lumiet* or *tinchien, selong* and *gelang ghirieng*, all of which are described in due order.

The *bidang* is a short petticoat reaching from the waist to the knee, and is kept in its place by being folded over in front and tucked in on one side. It is manufactured from their own cotton fabric, which is first partially dyed and then worked into a variety of patterns to which the most fanciful names are given. The *bidang* worn in mourning is stained a deep indigo blue, and is called *kain baloi*. A lighter shade is worn out of mourning especially by the Ulu Ais, and is often adorned by them with small cowries or pearl buttons, and fringed with *grunongs* or little tinkling bells.

The *klambi* or jacket worn by the women is if anything larger than that worn by the men. The patterns are precisely the same but the texture is finer. The Saribas women wear besides a jacket dyed a ruddy brown with mangrove bark, with a square embroidery on the back, and a fringe of hawks' bells.

The *balong* is a chaplet of odoriferous berries worn by marriageable girls.

The *tusok pendieng* is a thin plate of embossed metal which is soldered to a small tube passing through a hole in the lobe of the ear; this tube is filled with a nut which screws into it, and keeps the tube from falling out.

The *tina* are slender hoops of crimsoned cane worn round the waist, and look like whalebone when coloured black, as they invariably are in mourning costume.

Rangki are the shell armlets already described under the name of *simpai lengan*. They are only worn upon especial occasions, and form part of the full dress of a woman of fashion. As they are far smaller in size, and not so well finished, they are less costly than those worn by the men. Some eight or nine however are worn upon each arm, the more the better in their opinion.

The *lumiet* is the *rawai* of the Malohs (Malaus) and is a much esteemed body ornament of the Sakarangs. It is composed of a series of cane hoops covered with an infinity of diminutive brass links. A few of the hoops are made larger

than the rest so as to hang loose on the hips. The series that encase the waist and the stomach fit close and are pinned together with brass wire; they are sometimes worn up to the nipples, but not every woman can afford to be at such great expense.

The *tinchien* is the body ornament of the Ulu Ai and Ngkari women. It is composed of some eight or ten parallel rows of large brass rings long enough to encircle the waist. They are strung on rattans and connected with one another by a network of cane inside. The ends of the band are furnished with a pair of vertical plates of the same metal, the outer edges of which are curled, the one inwardly, and the other outwardly, so as to catch one another, and effectively lock in the body. The rings (with the exception of every alternate one, which is an ordinary finger-ring), are long and broad, and rudely engraved a variety of patterns. These rings cost eight shillings a string, and a complete set of ten would cost five pounds.

The *selong* are dense coils of thick brass wire many fathoms in length, and of enormous weight, worn on the leg from the ankle joint to the thigh; they are not worn every day, as may readily be conceived.

The *gelang ghirieng* bracelet is not described.

Love of finery is inherent in the young of both sexes; the elderly are less fond of it and often dress very shabbily and save up their good clothes for their offspring.

The women sit with their legs straight out in front, and their petticoats tucked in between their thighs so as to expose nothing, but they expose their breasts.

The Sakarang girls are very fond of using an oil made from the *katioh* fruit, which has the scent of almonds; all their clothes are made from native cloth of native yarn, spun from cotton grown in the country. The inner bark of a tree called *ipoh* by the Dyaks and *tajam* by the Kyans, and which appears to be identical with the Upas tree of Java (*Antiaris toxicaria*), is used for clothing, and the young tree is grown for this purpose in Dyak gardens; the bark is not pulled off until a year after the tree has been felled.

Hair dressing.—The women make no attempt to part their hair but push it over the forehead and gather it into a knot at the back of the head—a plain or fancy one as the occasion may warrant. They use no oil of their own manufacture, but all who are able to afford the luxury may obtain it from the Malays. The hair is not so long as it might be, and is frequently cut short during dangerous illness. The circumstances of their lives are not favourable to a luxuriant growth. They have in common with the men their full share of exposure to

all weathers, together with hard work out of doors as well as in doors. Flowers are worn in the hair as ornaments—red and green being the favourite colours.

The men dress their hair in a variety of ways. The genuine Ulu Ai fashion is to let the back hair grow long and flowing, and to keep the front either shaved or close cropped. The Ngkasi style is to shave in front and to keep the back hair close cropped, to shave again across the back of the head but to leave two parallel rows of hair and a tiny lock beneath them in the centre. The Kyan method of dressing the hair is, however, fast becoming the fashion among the dandies of all the tribes, *e.g.*, to permit the back hair to flow to its full length over the shoulders and to grow the front hair over the forehead long enough to form a Grecian fringe. When it is inconvenient to have the back hair streaming over the shoulders, they twist it and tuck it carefully into the turban.

Depilation.—The prejudice in favour of a smooth face is so strong that in the whole course of my experience I have never met with a single bearded or moustached Sea-Dyak, although it cannot but be manifest to a close observer that were they only so disposed they could produce a thicker crop than the Malay. This is evident especially in the case of old men and chronic invalids who by reason of age or infirmity have ceased to care much about their personal appearance and whose chins are rough in consequence with a bristly growth. The universal absence of hair upon the face, on the chest, and under the arm-pits would lead the superficial observer to infer that this is owing entirely to a natural deficiency, whereas it is due in great measure to systematic depilation. *Chunam*, or quick lime, is frequently rubbed into the skin so as to destroy the vitality of the follicles. The looking glass and tweezers are never out of the hands of the natives, and they devote every spare moment to the conscientious plucking out of stray hairs. It is likewise the fashion for both sexes to shave the eyebrows and pluck out the eyelashes. The growth upon the pubes in both sexes is often copious enough—some few Loweas object to even this, and either crop it close or remove it altogether. Female Dyaks eradicate the hair off the *labia pudenda*. I know a Malali at Kanowit who is bearded from ear to ear, and when he shaves, which is every now and then, his chin and cheeks are quite blue; he was a Mentuari of unmixed blood.

The Undups regard it as provocative of headache to throw their refuse hair into the fire or into the water. It may be cast on the ground or tossed to the winds; it is still better to bury it in the earth.

Tatuing prevails to a small extent among the Sea-Dyaks, but it is by no means universal among them. It is besides a custom of very recent introduction but is steadily gaining ground, though as yet it is confined to the male sex. I have seen a few women with small patterns on their breasts, but they were exceptions to the rule and were not regarded with favour. The marks or patterns are found more commonly on the arms, shoulders, and thighs; occasionally also on the forehead, throat-apple, chest, and ulna. The patterns are small, of a bright blue tint, and supposed to improve the appearance of the men. They have no other use or signification whatever being neither distinctive of race, family, rank, nor of individual. The pigment employed is a solution of soot (dammar-soot), which is rubbed into the skin after it has been punctured. Tatuing has not yet acquired the dignity of a profession. Few Dyaks are really able to puncture with skill, although many of them can trace designs; but as their own designs are poor imperfect imitations of the Kyans, they disfigure the skin rather than adorn it. They say they are able to eradicate the pattern by puncturing it over again with the acrid sap of a forest tree. The designs employed are not numerous although four are in common use. The practice is simple but requires practice like most things. The design is first carved on wood in relievo; it is then smeared with the sooty preparation and printed on the skin. The figure is then punctured in outline with a set of needles dipped in the ink (for such it is), and afterwards filled up in detail. More ink is poured on to the skin and allowed to dry into it. Rice is smeared over the inflamed surface to keep it cool; if this is not done, it is apt to gather and fester. The limb operated upon must be kept free from wet, and must not be scratched however much it may itch. The operator of course requires to be remunerated, but as he is not a professional he is satisfied with a moderate guerdon.

Among the Lugats there was a certain Aman Jerin who was partially but beautifully tatued in patterns of a bright blue tint.

Painting.—The men never paint their bodies, but the women after bathing often colour themselves from the waist upwards with turmeric to render themselves yellow and attractive. The result is far from agreeable to the eye of an European, but for this they care little so long as their efforts to please are appreciated by the men of their own race, which appears to be the case.

Scars.—The men do not make any use of raised cicatrices to ornament the body, but they are proud of scars nevertheless

and especially if they are regular and symmetrical. They are particularly proud of their vaccination marks if they show out well, and are equidistant apart. The women often prove the courage and endurance of the youngsters by placing a lighted ball of tinder on the arm, and letting it burn into the skin. The marks thus produced run along the forearm from the waist in a straight line, and are much valued by the young men as so many proofs of their power of endurance.

Ear-holes.—The rim of the ear is perforated from top to bottom with sometimes as many as twenty holes to support the ear-rings commonly used by the men. The lobe of the ear is also pierced and enlarged to receive a pendant. These organs present a hideous appearance when the ornaments are laid aside, as they reveal in all their deformity the slits and sores, while to add to their uncomeliness the holes are plugged with bits of wood to keep them open. These ear-rings, especially the heavy shell ones, oblige a man to lie flat on his back when he is going to sleep, it being painful to rest on the sides of the face.

Kyans and others wear tiger cat teeth in the tips of their ears. The points of Dians (a native on the Rejang river) I observed turned upwards, which is not usual, and he said it was an old custom revived by a chief named Hang. The Uma Lesongs wear two such teeth in each ear, the upper one pointing upwards, the lower one downwards; those who are unable to procure the genuine article wear imitation ones carved out of horn or bone.

Teeth filing and staining.—The upper incisors of both sexes are often filed into a single sharp point; a hole is bored through the centre of each and filled with brass. The enamel is scraped off with a rough stone, and the teeth are rubbed with leaves which stain them black. The lower incisors are ground down to half their natural size and blackened in the same fashion, but are neither pointed nor studded with metal. Caries is rare, and the natives seldom suffer from tooth-ache. The teeth are naturally beautifully white and regular, but it is the fashion to disfigure them in this manner as they approach the ages of puberty—boys do it when they begin to care to please the women. They dislike white teeth and consider them hideous. I once saw a Sakarang wearing over his natural teeth a thin brass plate (*lios*) cut to resemble a row of pointed teeth; this was worn over the upper incisors and hooked into the molars. I believe the boy picked up the notion from the Mentuaris or Malohs (Malaus), but I do not imagine it is common with his tribe as I never saw another with it either before or after.

Circumcision.—Circumcision is practised but it is not

universal or obligatory, and is only performed upon males. In the female the clitoris is said to be amputated.

The spritsail yard in the penis.—The *palang* is a smooth bar of bone or metal, the size and length of the bar of an ordinary watch-guard, with the ends rounded off. It is not generally so elaborate as the *utang* (perforation of penis) used by the Kyan chiefs, but it is equally effective and gratifying to the female. The *palang* is not, however, a Dyak institution; it originated with the Kyans, but it is fast becoming popular with at least a portion of the rising generation. It is nevertheless a pernicious practice, and ruinous to the male organ, even if the operation be skilfully performed; it is therefore to be hoped that the young fellows will discover their mistake before it is too late and refuse point blank to pander to the vitiated propensities of the looser behaved females. These latter encourage the practice for their own selfish purposes by every artifice in their power. The truth appears to be that no woman once habituated to its use will ever dream of permitting her bedfellow to discontinue the practice of wearing it. The Dyaks are satisfied with one, the Kyans, especially the chiefs, with sometimes as many as three at a time. The operation is a painful one for any man to submit to, and if the hole be not driven clear of the urethra the consequences are apt to be serious in the extreme. The member is first immersed in cold water and when numb to all sensation, the glans is compressed sideways between a pair of perforated bamboos, and a pointed brass peg is driven through it with a single blow, but in such a manner as to pass above the urinary canal. The *palang* is then introduced as the peg is slowly drawn out.

The *palang unus*, as it is called, is also used by the Dyaks. It is a ring, or collar, of plaited palm fibre, furnished with a pair of stiffish horns of the same wiry material. It is worn on the neck of the glans and fits tight to the skin so as not to slip off. The idea is in all probability borrowed from the Malays.

5. *Hunting.*

Hunting with dogs.—Hunting is with the Sea-Dyaks an occasional pursuit rather than a steady occupation or a necessity of existence. They subsist more upon a vegetable than an animal diet, and they fish far more than they hunt. They only form hunting parties once or twice a year, when the entire village is about to celebrate some periodical festival, and it becomes an imperative duty to provide an abundance as well as a variety of food for the guests. Other tribes devote more time to the chase

and less to the soil. The hunter usually proceeds on foot, accompanied by his dogs, which run on ahead and beat up the game, while he dawdles about gathering things on the way that may be useful to him. He knows when his beaters are on the scent by their peculiar clamorous bark, and he hurries up to spear the animal they have brought to bay. A Dyak village swarms with dogs, but few of them are fit for the labours of the chase, being for the most part curs that whine and howl and are of no use whatever, except to consume the refuse food and prowl about the premises. They are small in size and of a tawny colour. The breed is known to the scientific world by the specific name of *canis rutilans*. Some are striped with black, others are plain; they are called *saih* or *sabit*, according as they are one or the other. The former are the fiercer looking of the two. The best of them, that is to say, those employed in the chase, are plucky little animals and will worry a boar three or four times their size and not give in until cruelly mauled. Such dogs are worth their weight in dollars to those who are fond of boar and venison, and invaluable to those tribes who, like the Batakans, depend upon the hunting path for their food.

The quarry is carried on the back in a pack-basket suspended from the shoulders, and is cut up at home. If it is too heavy or too bulky to be transported in this fashion it is either cut up on the spot or dragged by the leg along the ground to the nearest watercourse and conveyed home in a canoe. The Dyaks infinitely prefer pork to venison, the former being the richer, fatter, and juicier of the two; indeed the venison of the country is coarse and devoid of fat. There is no waste in the preparation of animal food. The horns and tusks come in for a variety of uses, ornamental, superstitious, and economical. The larger bones are preserved to be hereafter fashioned into knife handles. The smaller bones are chopped up with the meat and fat to be afterwards salted or smoked as choice may dictate. All pickled food, *makasam*, is esteemed, and especially so pickled pork; pickled venison and pickled fish are devoured with immense satisfaction.

The Kiñahs preserve the skulls and jaws of the animals killed by their dogs in the chase, and of such as they offer in sacrifice; but they abandon them when they abandon the village, for it is not permitted by custom to take them away from one place to another.

Spring bows.—As the woods are full of pig and deer, the Dyaks resort to various contrivances to secure these denizens of the forest. Spring bows are set and pitfalls are dug in likely places for them to run against and tumble into. The *peti*, as

the spring bow is called, consists of a single bamboo lance attached to an elastic stem. This lance is laid in a horizontal direction above the ground about the height of the animal it is intended to transfix. A sapling bent for the purpose forms the spring by being held back; a string crosses the path, the least touch of which loosens the spring and forces the bamboo in a straight line across the path and consequently through the animal that may happen to be passing.

The *nklubang*, or pitfall, is another common contrivance to impale game. The bottom of the pit is staked with bamboo or iron-wood spikes, and the opening is covered with twigs and leaves so as to be in no way distinguishable from the surrounding vegetation.

Deer snaring.—The *jarieng* is also in use among the Dyaks, the idea being borrowed from their neighbours the Malays. The object is to drive the deer into the meshes of a net and to kill them before they can break through. This sport requires nerve and a quick eye to avoid ugly wounds from the hoofs and antlers. The *jarieng*, as this net is called, is simply a long cane cable with a continuous series of cane loops or nooses depending from it, and standing five feet high; if a single cable be insufficient, two or more are joined together until the required length is attained. A bend of the river is selected where the deer are known to lie hid. The net is then stretched across the narrow neck of land, and upheld in an upright position so as to intercept the stampede into the bush. The party then divides, some to watch the net, others to drive the deer towards it. This they do simultaneously from both sides of the point, yelling and shouting with all their might and barking like dogs to rouse the game. The startled deer spring from their coverts, and bounding towards the forest encounter the net and get entangled in its meshes. Before they have time to extricate themselves they are despatched by the watchers. This sport can be followed in the night time as well as in the day time provided there be moonlight.

Springes.—The smaller kind of game such as porcupine, pheasant, partridge, jungle fowl, &c., are caught in springes, and by these alone a clever woodman can supply daily his family with this kind of food in abundance. The cord made use of for their springes is of their own manufacture, very fine and strong, and made from the inner bark of several kinds of trees. They have also *cage traps*, into which the squirrel and mouse deer are attracted by choice food, and which fall upon and detain them. Pigeons and other birds are caught with springes and *bird lime* placed in the trees which they frequent for food, particularly the different species of *Kasu ara* (ficus)

which are very abundant and on which the many species of these birds delight to feed.

The *sumpitan*.—Great accuracy is shown in the way in which this tube is drilled out of a hardwood shaft some seven or eight feet long. Among the Punans it is common to destroy wild boar, deer, &c., with the darts.

Pig sticking.—Once a year, when the falling fruit is thickening upon the ground and the pigs have cleaned out one side of the river, they instinctively take to the water and endeavour to reach the opposite bank. The natives know when to expect this wholesale movement on their part, and as the time draws near they form parties to waylay the pigs at various points. They wait patiently for days together, and are rewarded ultimately by spying a herd issue from the forest and plunge into the stream, following their leader in a dense compact mass. When they are well in the current the canoes dash into their midst, sticking them right and left, making enormous bags. As the swine have been feeding upon fruit for some time past they are fatter than usual and their meat is better flavoured.

Crocodile hunting.—From superstitious motives the Dyaks do not interfere with the crocodile until it has developed a man-eating propensity. They then turn out in a body and make war upon the race and slaughter it wholesale. They take the heads and hang them up over the fireplace side by side with the cluster of human heads which depends from the roof. When the Dyaks of Pulo Pisang lost one of their number a few years ago they made a war path and killed sixteen crocodiles in revenge, and when Avan Nyipa, of Batu Gadiang, lost his wife, the Kyans and Sebops turned out *en masse* and destroyed thirty within a month. They probe the bottoms of the pools and other likely places with long poles and compel them to rise to the surface and despatch them with their spears. The Undups believe, or affect to believe, that the crocodiles are partial to their tribe, and they are therefore reluctant to slay them. They say that once upon a time when the king of the crocodiles fell ill and was sick unto death an Undup medicine man was fetched to cure him, and received as his reward a distinct promise of immunity from ravage for himself and his tribe for evermore, notwithstanding which, however, an Undup woman was afterwards seized, but the monster let her go when she screamed out. She was rescued by her friends, who declared that the brute mistook her at first for a Sakarang, but let her go when her voice proclaimed her to be an Undup.

The ordinary way to take a crocodile is with a baited wooden hook and slack cable. The most irresistible bait is the carcase of a dead monkey (dog or fowl will do), and the more over-

powering the stench the greater is the probability of a bite, as the brute will only swallow putrefying flesh. Fresh meat is carried away between the jaws and hidden in some safe place until it decomposes. The line is a loose one of rattan, many yards in length, and is not made fast, so that the reptile may drag it away with him when he bolts the bait. The buoy at the other end of the line floats on the water and serves as a clue to his whereabouts; and when he is discovered he is hauled ashore and pinioned. While this is being done he is addressed in eulogistic language and beguiled, so to speak, into offering no resistance; but the moment his arms and legs are bound across his back and he is powerless for evil, they howl at him and deride him for his credulity. They then rip up his belly for human remains and hew him to pieces. He struggles furiously at this stage but to no purpose, and is speedily decapitated with an axe. A short stick pointed at both ends is often used instead of a hook, and is secured to the bait in such a fashion that it is swallowed lengthwise. To ensure this result the bait is hung upon a bough overhanging the river, but several feet above the level of the water to oblige the crocodile to spring upwards in order to reach it. The efforts he makes to disgorge the wood work it round so as to stick in his throat crosswise. It is usual to hang a dog higher up in the same tree so that he may attract the cruising reptile by his unhallowed howling.

The Sarawak crocodiles vary in length from ten to twenty-six feet, but the common size is from ten to fifteen feet. They become a public nuisance from the date of their first human meal, and are thereupon hunted to death. Manang Blitang, of Yong, is perhaps the most successful and persistent crocodile trapper in the Rajang River. He is supposed to possess supernatural power over them, and his services are therefore always in request where a seizure has occurred, and the kinsfolk are anxious to discover the whereabouts of the guilty reptile.

The porcupines and monkeys are hunted for their bezoar stones,[1] the squirrels for their fur and their teeth (squirrels' teeth are used for necklace tassels); bears and tiger-cats and panthers are hunted for their canine teeth, their skins being used for war-jackets and seat mats; the hornbills, jungle fowl, and argus pheasants for their plumes for decorating helmets and sword sheaths; the bill of the rhinoceros hornbill is wanted for ear pendants and helmet crests, and crocodile teeth are wanted for ointment cases; bears' teeth and boars' tusks are wanted for charms, and the crimson horn of the *buceros rhinoceros* is used

[1] Calculi formed in their stomachs, much valued as amulets.

for ear pendants ; the helmet of the *galeatus* is used for a sword-buckle.

6. *Fishing.*

The Dyaks are expert anglers, and fishing is with them a favourite occupation. They commence fishing at a very early age, and the habit grows upon them rather than otherwise. They are fond of the water and both swim and dive well. They swim hand over hand like dogs. They never take a header in diving but jump into the water upright, sinking feet first.

Diving for Fish.—They often catch the fish in the upper waters by diving into the rocky pools and pulling them out of the holes and crevices. The *sema* especially are caught in this way.

Curing.—The women cure the fish. They either dry it in the smoke of a wood fire, or cut it up and boil it in brine and so preserve and pickle it, making *makasam ikan.*

Scoop net.—The scoop net is used chiefly by the women who are fond of wading up the shallows, net in hand and basket *suitong,* slung from the shoulder, scooping up the prawns and periwinkles, &c., that come in their way. Sometimes they drop the fish into a hollow gourd which they carry.

Casting net.—The *jala* or casting net in ordinary use is made of *tengang* string dyed claret colour, with *samak* to preserve it, and is weighted with stones if nothing better is to be obtained.

Angling.—They fully understand the use of a bait and invariably bait their hooks. Fish lines are made of the *apieng* palm.

The *Fish-spears* in use are the *penawan* and *serampang;* the penawan is simply a barbed spear with a slender iron fore-shaft; the serampang is a forked spear furnished with a long bamboo shaft, and with either two or three metal prongs.

The *Fish-traps* in every-day use are the *bubu* and *abau.* They are both of stiff basket work and resemble an acorn in shape ; the only difference between them is that of size ; the latter being infinitely the larger. The traps are made of the ribs of the apieng palm.

Fishing by torchlight.—Another mode of fishing is to creep along the bank in a canoe after dark with a torch in one hand and a fish spear in the other, to stick the mudfish as they rise to the surface confused by the light. Prawns are also caught in this fashion but with a hand net.

Tubai fishing.—But the favourite form of fishing whether on a large or on a small scale is with the *tubai* root (*menispernum*) the juice of which is baled into the stream to poison its waters and to cause the fish to rise stupefied to the surface. The *empang*, or basket work screens, are first erected at the mouth of the river to prevent the escape of the fish into pure water. Each person brings his own *tubai*—a bundle or two. A *karangan* is selected where suitable stones abound. It must be two or three hours' pull from the entrance or the sport would be over too soon. The canoes line either bank, and at a given signal the entire *bala, i.e.*, party, commence to hammer out the root and soak it in the water in the bottom of their boats. A few minutes later when all hands are ready the poisoned liquid is baled out into the stream, and the canoes after a short pause begin to drift slowly down the current, and as the fish rise to the surface, they are speared with fish-fork or captured with hand-nets. The best of the fun is over in an hour or two, but many remain, nevertheless, until late in the evening to watch for a fresh rise. The women join in the sport and scoop up the small fry with their nets. It is forbidden by custom to hurl the spear at the fish; any accident arising from an infraction of this rule is punishable by fine.

7. *Navigation.*

The canoes are hollowed out of a single log by means of fire and the use of the adze. The natives have no measure to ensure accuracy, but are entirely guided by the eye. Generally the canoe shows traces of the fire and water treatment it has received, the inner surface being soft and full of superficial cracks, while the outer surface is hard and close. When the shell has been sufficiently opened out, thwarts are inserted to prevent its shrinking as the wood dries. Planks or gunwales are stitched on to the sides to increase its volume, the seams being caulked with sago stems which are light and porous, and swell when wet and so keep out the water. Each of these side pieces is formed of an entire plank about 12 inches deep and about $1\frac{1}{2}$ inches thick, laced on to the body of the canoe by flaxen cords and united to its opposite plank by the thwarts. The largest canoes have the sides made still higher by means of a narrow plank laced on to the first gunwale, and the seam again caulked. The canoe is alike at both ends, the stem and stern being both pointed, curved, and rising out of the water. There is no keel, and the canoe draws little water. There are no ribs nor is there any figure head.

To make a bark canoe the native simply goes to the nearest

stringy bark tree, chops a circle round it at its base, and another circle 7 or 8 feet from the ground; he then makes a longitudinal cut on each side, and strips off as much bark as is required. The ends are sewn up carefully and daubed up with clay, the sides being kept in position by cross-pieces. The steering is performed with one or two greatly developed fixed paddles.

8. *Weapons and War-dress.*

The *slighi* is a wooden lance, the point of which is hardened in the fire. It is used as a missile and is hurled at the enemy. It is usually of ironwood (*bilian*), but palmwood javelin, especially *inbery* is also used. They are showered upon the enemy at the commencement of an engagement before the parties are close enough to use the spear, which never, or rarely leaves the hand.

Dart stems are made of the palm called *apieng*. The poisonous juice of *tasam* tree is used for their darts; it is dried over the fire until it becomes a hard paste, and is then softened with the juice of an *akar*, creeper.

The *sangkoh* is a long wooden shaft with a steel spear head. The shaft is usually of ironwood, with a spud of bone at its butt end. If it has no spud it is pointed so that it can be stuck into the ground. It is always held towards the point, rather than by the centre, and over the right shoulder, the butt end up in the air, and the point towards the ground. The blade is of steel, and is 12 inches in length, and broad towards the point; the tang is not inserted in a slit in the wood, but is bound on to the stern with cane or brass wire, and is very firm. The spear is used at close quarters to thrust with, and is held in the right hand—the shield occupying the left. The shaft is occasionally carved, but more often plain. I have one in my collection with six or seven brass rings, indicating the number of warpaths made by its owner.

The *dukn*, or *parang pedang*, is the scimitar so much worn by the Malays, and differs only from it in being thicker and heavier. It is formed after the pattern of a German cavalry sabre, and has a cross-handle of brass. The blade is two-edged at the point, so that it can be used for thrusting as well as cutting. The sheath is of some light wood, and is stained crimson with dragon's blood. The Undeys and Balaus in particular have their sheaths covered with silver work, and the hilt with silver. The hollow of the hilt is decorated with human hair, and the edge of the sheath is adorned with a row of the wing feathers of the hornbill. The Malays wear the sword with the edge upwards but the Dyaks wear it with the edge outwards.

The *parang ñabur* seems to be the only really genuine Dyak weapon. The *parang pedang* they have copied from the Malays, and the *parang ilang* is altogether a Kyan weapon, and beyond their powers of imitation. The *ñabur* in ordinary use is a short curved sword with a bone handle. This style of sword is broadest at its points of curvature. It does not curve like a scimitar from the hilt, but is straight for some distance, and takes a sudden curve towards the end, and when the sword is long, as is one in my collection, it becomes top heavy and requires both hands to wield it effectually.

The *parang ilang* is the Kyan *malab* (*mandau* elsewhere), and is preferred to any other side arm by Malays as well as Dyaks. It is the ambition of every Dyak lad to be presented with one of these.

The Uma Bawangs are famous for their *parangs*, which they make out of their own iron ore.

The war costume consists of a basket-work hat called a *katapu* and a skin-jacket called a *gagong;* in lieu of the latter the *klambi taiah* (?) a quilted jacket is used. These form but poor defensive armour for the body; reliance is placed upon the shield.

The *katapu* or helmet in general use is a round skull cap of wicker work, with a rush lining and occasionally a skin covering, surmounted by either a metal plate or two of fanciful pattern or the scaly armour of the *tenggolieng*. The crown is decorated with the plumage of birds and the sides with tufts of human hair. The rim is bordered with scarlet flannel and embroidered with nassur shells.

The Kyans and Kiñahs wear on their headpieces the tail plumes of the helmeted hornbill—each plume signifying a dead enemy.

The *gagong* or war-jacket is a skin with a hole and slit in the neck of it to admit of the insertion of the warrior's head, the animal's face falling on his stomach, and its back hanging over his shoulders and reaching below the waist. This dress is by no means universal among the Dyaks, as suitable skins are not so easy to obtain. Goat skins are preferred by them to any other, being long haired at the shoulder, and black is preferred to white; bear skins and panther skins are also in use but more sparingly. The animal's face is usually covered with a metal plate, or a mother-of-pearl shell, to protect the pit of the stomach, and the back is decorated with bunches of hornbill feathers. The gagong is worn more for its warlike appearance than for any real protection it affords the wearer. It may possibly divert a wooden javelin, but it is no defenc against the thrust of a spear. The Kiñahs wear the mandibles of the

Bucerotidae (hornbills) in pairs on the breast of their war-jackets of skin to record the number of persons they have killed with their own hands—one pair for each person killed.

The *klambi taiah* is the *boju tilam* of the Malays, and is a padded or quilted cotton jacket, for the most part sleeveless and collarless. The striped variety is the one most in request. It is thick enough to be able to protect the body from the blow of a wooden javelin, but is useless against a spear.

The *trabai klit klau*, or shield, is with its handle hollowed out of a single block of wood. Its form is oblong and convex with a ridge along its centre. It is held in the left hand well advanced before the body, and is not meant to receive the spear point but to divert the spear by a twist of the hand. It is often coloured with red ochre or painted some elaborate design or fantastic pattern. It is large enough for its purpose, but it is small compared with the shields manufactured by the Sibus and others. There are also seen in use among them wicker-work shields of plaited bamboo, corresponding to the wooden ones in length and size.

9. *Aggressive Warfare.*

Dyak warfare is far from despicable, although it is undisciplined, and when the command is assumed by a person of sufficient influence to enforce obedience, the force at his disposal becomes more formidable than it otherwise would be; but this is not so often the case now as it used formerly to be. In fighting, the warriors cluster round their chiefs and are indifferent to the fate of the others so long as the chiefs escape with life and limb. Similarly relatives cluster together, preferring to entrust their lives to the tender mercies of one another, rather than to a stranger; a relative would bestride his fallen kinsman and protect his body from mutilation, when a stranger might decline the combat and leave him to his fate. They carry away the dead and wounded when possible; the former they bury, but, if hurried, often so imperfectly that the enemy scent them out, dig them up and carry away the heads. When unable to carry away the dead, they have sometimes severed the head from the trunk and carried it away with them to bury in the forest, rather than let the treasure fall into the hands of the enemy.

It is customary to announce a coming war expedition for such and such a season at one of the great feasts, when the village is thronged with guests from the country far and near, and when there is sure to be an unusual gathering of powerful chiefs. The speaker, who must be a great chief, gives his reason, that

his people wish to put off mourning, or that his people have been slain and he must have some revenge, and he ends by inviting all present to accompany him on an incursion upon an ancient enemy. If he be a chief of any real influence he is sure to secure an ample following, in reality more than enough for his purposes, but his ambition expands as his numbers increase and his warpath assumes grander proportions. The women lend their assistance to induce their husbands and lovers to join the warpath. Before this, however, the chief whose mind is set on the business gets together a circle of chiefs and warriors, which before the end of the proceedings resolves itself into a council of war. The expediency of the campaign and the exigences which demand it are then openly debated, and if the majority or even a strong party are in favour of it, the chief who originally broached the topic, if he feels confident of a following large enough to effect his purpose, announces his intention of becoming a leader and the date of the departure for the enemy's country. All present are invited to accompany him and to bring their friends and relations. The details are then discussed, the amount of *bekals* (baskets) necessary, the route, the character and number of enemy, etc. The period usually selected for any expedition on a large scale is that immediately after the seed planting or after the harvest; the former time is preferred when available as they can spare the time better, and have three months clear before they are required to gather in the harvest. In the latter case they would probably have no farms at all for that year, as they would have no dry weather to dry the clearings, which, therefore, would not burn well.

As the time draws near for the expedition to start, a spear is sent round the country from village to village with a *tembubu toli*, to signify how many days are to elapse before the commander-in-chief is able to make a start; a place is also mentioned where he will await the force. The women are everywhere busy preparing the *bekals*, and the produce of the gardens are taken to the nearest market to exchange for tobacco, *chunan*, *gambir*, etc. The men on their part have been busy in getting the war boats ready, launching them into the river, lashing on the planks and fitting them up with palm leaf awnings and bamboo floorings. Those who are able to purchase the material, plane the bottom of their canoes to make them smooth and tar them to preserve them, make figure heads for the bows, and paint the side planks in various patterns. They take nets with them to fish by the way, and dogs to hunt with if the distance is so great that they are likely to run short of food, but their chief support on an expedition of this kind is what they find on the banks and in the forest—especially the

wild sago. The men are very busy furbishing up their arms and sharpening their weapons and decorating their helmets and war-jackets. [As long as the men are away their fires are lighted on the stones or small fireplaces just as if they were at home. The mats are spread and the fires kept up till late in the evening and lighted again before dawn, so that the men may not be cold. The roofing of the house is opened before dawn, so that the men may not lie too long and so fall into the hands of the enemy.]

The chief is always the first to leave the village, and as the first and chief part of the journey is by water, he pulls away in his canoe, and at some convenient distance from the village, he bivouacs for the night to *beburong* —to consult the omen birds. If the omens by birds are favourable, he proceeds to the tryst and there awaits the force as it dribbles in one by one or few by few. When all or most have arrived the flotilla moves on uncontrolled until it reaches the *pengkalan* or landing-place, whence the overland route commences. There is no attempt at order or regulation as long as they are in the water and in their own country, every boat stopping and moving much as it pleases, but all trying, nevertheless, to reach the pengkalan at once. If this is close by there is a dash for it, but if it is several days' journey there is a good deal of loitering by the way to increase their stock of provisions or to equip themselves more fully with *kejangs* (deer), poles, *tukahs* (pegs), etc. and cords for hauling rapids. The chief brings his musical instruments with him and plays on his gongs and *lawahs* as he sweeps along. The line of march is most irregular, the canoes not moving up in a line but with wide gaps, some outstripping each other, others lagging behind to cook and angle, others deterred by bad omens and adverse dreams obliged to halt for the day, others to dry their things capsized in the rapids, etc.

It is a grand sight to see these canoes filled with dusky warriors whose naked arms and bodies are just visible beneath the awning, pulling away with a uniform and vigorous stroke, each arm with its white shell bracelet, and the chief standing up in the stern steering the rudder with hand and foot. The canoes hold each from twenty to seventy men.

Arrived at the landing-place, a camp[1] is formed, but the huts are not arranged in any military fashion, but line the banks of the river. The *langkan*, or hut, is built sometimes to accom-

[1] Kyans, when they make their camp, strew dead leaves outside the fence so that no one, not even a dog, can approach without being heard. Punans make their camp in a circle, each hut facing a different direction, so as to prevent a surprise.

modate a whole boat's crew; the warriors lie side by side, their spears are stuck in front, and their shields and swords in their hands, so that they can spring to their feet, arms in their hands, in the twinkling of an eye. The roof slants upwards from the ground and forms an angle with it. It is thatched with leaves and branches; the flooring is of the same material with a layer of bamboo or sticks. A fire is lit hard by to keep off the mosquitoes and sandflies, who are often troublesome. These huts are meant to last a single night, or several, according to the care with which they have been built; but stronger huts are reared when a stay is expected to exceed a few days. Here a halt is made of several days' duration to explore the neighbourhood, and to permit stragglers to come up. The canoes are hauled up and concealed in the forest, and the track examined. A war-council is held, and the route marked, and the situation of the enemy discussed, and on a given day the march commences, each one shouldering his pack and stepping out in Indian file—the guides ahead, and closely followed by a few of the hardiest, boldest, and most experienced men at their heels. This line of march reaches many a mile if the war party be a numerous one. The pace is rapid so long as they are in neutral territory, but slackens as soon as they reach the borders of the enemy's country. The leaders then proceed more warily as the enemy, if forewarned of their approach, are pretty sure to be posted in ambush by the way.

As Dyak warfare consists of surprises, they do not attack a village, or a cluster of villages, if their approach has been discovered and the population is on the defensive, but they content themselves with cutting off stragglers, and lie in ambush at the waterside for people going to bathe or to examine their fish traps, and in the forest for individuals out hunting or produce collecting. But if their approach be unknown, they so manage as to reach the settlement before daybreak; generally they draw a cordon round it at midnight, and tighten the circle before daybreak. If the ladders are down they rush up to the house and take it by storm; if they are drawn up they hurl lighted javelins into the thatch and fire it. They never spare the men, and rarely the women. Heads are more valuable than captives, but they do sometimes make the women and children prisoners, and reduce them to slavery.

When argued with about their head-hunting expeditions, the Dyaks plead ancestral custom: "It is the custom of the white man to read books, it is the custom of the Malays to say their prayers, but it is our custom from ages to go on the warpath."

10. *Defensive Warfare.*

If the Dyaks have reason to apprehend an attack upon their village, they put it immediately into a state of defence, *i.e.*, they raise a tall palisade around it and encircle this again with a wattle fence and *chevaux de frise* of spiked bamboos. The waterside, the landing-places, and the approaches to the village, are all spiked, and also the foot of the ladder, and they dig pit-falls in the pathway. Their valuables they conceal in the adjoining forest, or in the vicinity of their farms. The moment the enemy appears the sound of the *tawah* begs to announce their condition to their neighbours, and to summon them to their assistance. If they are heard help is sure to arrive *instanter*. If they feel confident of their ability to repel the enemy, they keep their women at home; but if there is any doubt about the matter, they conceal them with their treasures on the hills and flee into the forest to rejoin them at a rendezvous when resistance becomes hopeless. If they are in no hurry they fire the village before they leave it; if on the other hand they wish to gain time, and to divert the pursuit, they leave it for the enemy to plunder and burn.

A favourite stratagem is to entice the leading boats of the enemy into an ambush on shore. As everybody is anxious to be foremost in the race for heads, there are sure to be one or two boats so far in advance of the rest as to make it worth while to put them to their mettle. Some convenient spot is selected and a strong party placed in ambush among the trees. One or two men are thrown out to stroll upon the shingly bed to lure the enemy to their destruction. The moment they are caught sight of, the boats give chase, and as the warriors leap ashore, the men in ambush spring from their covert to their feet and hurl stones to shatter the shields, and engage with spears and swords in a short but desperate conflict. As the main body is seen winding up the river, whooping and yelling, and crashing up in clouds of spray and with a rush of waters, they plunge into the thicket with the heads they have obtained, and are far away before the enemy have recovered from their discomfiture, and are prepared to follow.

Another stratagem is one of ambush. When the head of the column is close upon them (the ambush), they discharge their muskets, leap from their ambuscade, and engage in a hand to hand combat. The Dyaks always waylay on the right-hand side of the line of march, as that side of the body is unprotected by the shield, which is carried in the left hand. A short, but desperate fight ensues, a few heads are taken, and the enemy scampers off with their dead and wounded

before the main body can come up. The invaders pause a while until reinforced, and then pursue, but the enemy have taken advantage of this delay to plant *tukahs* in the path and *ranjans* in the water-way. Some are sure to get spiked, and another delay ensues. The ambuscade is by that time beyond pursuit. If the enemy are plucky, they form several ambuscades, and so impede the progress of the *bala* (war-party).

When acting on the defensive, if it is intended to entrap an enemy by water, it is customary for the entire force to divide into two equal portions, and to be hid in two branches of the main stream, and sufficient distance apart, and when the enemy are in between, to dash out simultaneously and take them in front and rear. If the invading force is too numerous to try this, is to lure the leading boats by a decoy boat into a position where by reason of the rapidity of the current and obstacles in the river they can be taken at a disadvantage, and to scamper off with a few heads after a desperate and hurried fight before the main body comes up.

It is a defensive measure to blockade the passage up the river with huge trunks of trees felled right across, which form a temporary barrier to quick progress; stakes and tukam (?) are placed in all suitable places, and in the shallow beds to impale the feet, as the men have to tumble out of the canoe to haul it over the rapids, &c.

11. *Heads.*

The way of cutting off the head varies with the different tribes. They do not always cut it off the same way. The Dyaks and Bekatans have each a different way, and by the manner of it it is known whether it is a *pumjong iban* or a *pumjong Bekatan.* The Dyaks sever the head at the neck, and so preserve both jaws; they scoop out the brains through the nostrils and hang it up to dry in the smoke of a wood fire—the fire, in all probability, at which they are cooking their victuals. Sometimes they tear off a bit of the cheek skin and eat it as a charm to make them fearless. They cut off the hair to ornament their sword-hilts and sheaths, &c. If the jaws drop they fasten them up, and if the real teeth fall out, or if they extract them, they fill up the cavity with imitation ones of wood. They put studs in the eye sockets, but do not carve the skull, as do the Kyans. They generally plug the nostrils with wooden stoppers. Everything is done to propitiate the head; food is put into its mouth, betel nut is prepared for it, and even a cigarette; it is implored to remain among them, and to induce

more of its friends to come that way and keep it company. They cut out the tongue.

The head does not in an expedition belong to the person who takes it. It belongs to the chief, and if there are several it is distributed among the leading chiefs. If only one head is obtained, and there are many claimants to the honour of *salai*-ing it, it is broken into pieces, and a fragment given to each; but this is not popular with the Dyaks, and it is more usual for the most powerful chief to keep it. But the chief who salais a head undertakes a great responsibility, as he by that act aspires to be a war chief, and must lead the people on the warpath. They look up to him, &c. They do not mind his keeping the head as long as he gives them an opportunity of cutting off others. When brought home the head is hung up in the verandah of the house outside the chief's apartments along with the smoke-blackened cluster of heads depending from the sloping roof and overhanging the fireplace.

The Uru Ais believe that the persons whose heads they take will become their slaves in the next world.

12. *Captives.*

The Dyaks too often spare neither man nor woman nor child, but sometimes, when more humanely inclined, or when the opportunity offer, they carry the women and children away with them into captivity. But it is a remarkable fact that there are so few slaves, or persons of servile descent among the Dyaks. Other tribes keep their slaves in a condition of perpetual servitude, but the Dyaks allow their friends to ransom them, and if they still remain on their hands they adopt them into the tribe and enfranchise them. The ceremony is usually performed at a great feast, the owner announcing that he has freed so and so and adopted him as a brother, and he is presented by the chief with a spear, with which he is told to slay the man who dares hereafter call him a slave. They are not cruel to their captives, but humane. The one solitary instance in my experience of cruelty to a captive, is the one related by Rajah Brooke in his work.

13. *Cannibalism.*

[The following letter appears to have been sent to a Sarawak newspaper.]

"SIR,—I have just been reading a second time in 'Head-hunters of Borneo,' and in connection with it, Mr. Bampfyldes' remarks, together with Mr. Bock's rejoinder. I have been

asked by the former gentleman to testify to his credibility, and shall therefore feel obliged if you will be good enough to insert these few lines for the information of the public.

"I have been 400 miles up the Rejang River since the publication of the above volume, and though I had not yet read the book, I took it with me and showed the plates to the natives of the interior; so true were they to life that resemblances were found in the portraiture to their own friends, and every detail provoked roars of laughter.

"Mr. Bampfylde has, however, been over six years in Rajah Brooke's service, therefore his testimony, I feel sure, is preferable to that of a mere traveller.

"I fully believe, with Mr. Bampfylde, that the natives were poking fun at Mr. Bock when they declared the Trings to be cannibals. I do not believe them to be such, for if they were I should have heard of their propensity long before Mr. Bock ever set his foot in Borneo, for we have occasional intercourse with some of the tribes of the Upper Mahakan, among whom Mr. Bock should have travelled instead of stopping short at M. *Pchau*, which can be reached from the sea by steamers, and which feels the influence of the spring tides. Had he accomplished the ascent from this point upwards, he would have endangered his neck it is true, but he would have travelled over new ground, and added to our knowledge. A few months ago I received a visit from a Long Gelat, named Bau Dias, who lives at the foot of the Mokan ranges, and I put the question relative to the alleged cannibalism of his neighbours, the Trings. He seemed surprised at my asking such a question, and said 'Of course it is not true, such a practice is unknown to us at Mokan.'

"I do not accuse Mr. Bock of wilfully publishing an untruth, but I fully believe his credulity was practised upon by his companions to discourage in him any desire to penetrate further into the interior.

"I do not think Mr. Bock will require to return any answer to what I have written. I, for my part, do not wish to engage in any controversy, and disclaim any obligation to make further reply.

"I have the honour to be, Sir,
"Your most obedient servant,
"(Signed) Brooke Low.

"Sarawak,
"20*th September*, 1887."

14. *Musical Instruments and Singing.*

Rudieng.—The European Jew's harp is a small musical instrument held between the teeth, and having a metal tongue, which, when struck by the finger, produces musical sounds that are modulated by the breath. In the Dyak rudieng, the little finger of the left hand stretches the string loop at the left end, and the thumb and first finger hold the metal handle; the cross-piece is held between the thumb and finger, and pulls the concave inside. It is used by a young man to talk to his young girl at night, when they do not wish the mother to overhear their talk—they are able to understand each other in the language of love. The length is $3\frac{3}{4}$ to $4\frac{3}{4}$ inches; the narrow end is $\frac{1}{16}$ to $\frac{1}{4}$ of an inch wide, and the broad end $\frac{3}{8}$ to $\frac{1}{16}$ of an inch wide. It is a perfectly intelligible wind instrument; a metal plate of unequal width, narrowest where it is held in the left hand, and widest where it is held in the right hand. The string is jerked by the tongue, which is likewise metal, vibrates and resounds in the cavity of the mouth. The sounds are modified with the breath. Other tribes in Borneo use a bamboo one; this was no doubt the origin of the Dyak one; the Maloh have taught the Dyaks the use of metal. Bamboo ones are not now in use among them. The case in which it is kept is a bamboo cylinder beautifully carved; the ground is coloured red with dragon's blood; girth about $2\frac{1}{4}$ inches, fitted with a carved hard-wood stopper. The metal is not flat, but almost imperceptibly concave.

Serunai is made of a hollow gourd, *selaing*, with a hole, and is one-stringed (*segu* cane), and is played with a bow, the string of which is of same material. The performer sits on the ground and holds the instrument between his toes, the knees bending outward, and the soles of his feet adjoining. The sound is that of a violin played with a bow, and is mournful, wailing, sobbing, heartrending, dismal, and gloomy. The instrument is held slanting, and the sounding cup on the side of the foot, with the stem resting on the left shoulder. The string must be watered with saliva to sound. The stock is 2 feet long, and of hard-wood (*bilian*). The cup is 12 inches in circumference, and is a gourd shell, called *geno-selaing*, about the size of a teacup, and with a hole at the bottom. The mouth of it is covered up with a circular dish of soft wood, thin and close-fitting, and the seams cemented with *wild* wax. The bow is a bent cane, and the string a split rattan nearly 12 inches long. There is a moveable bridge on the dish for the string to rest upon. Sometimes the bowl is made of coco-shell.

The *blikan* is a rude-stringed instrument resembling a guitar,

and was formerly much in use. It was adopted from the Urus, and is more frequently found among the Seribas and Kalakan Dyaks than among any others. It is furnished with two strings (rattan) and two keys. The strings are pressed with the tips of the fingers of the left hand to modify the tone—there are no stops—while the nails of the fingers of the right hand brush the strings. The stock is glued into the beak or bill of a bird, the *kiñalong* or *burong bilch*, and the body is coloured red with the colouring matter of a wild-growing, poisonous fungus. It is 3 feet long from end to end. The *blikan* is hollowed out from the upper surface, and is covered with a thin plate of wood. The *safé*, on the other hand, is hollowed out from underneath, and is not closed up.

The *gendang* is a wooden drum, shaped like an hour glass, one end covered with parchment, which can be tightened or slackened at pleasure, by means of cords; it is not beaten with drumsticks, but is struck with the fingers.

The *satong* is a cylindrical bamboo harp, or lyre, played upon with the fingers.

The *gulieng* is a bamboo pipe, with a plug at the mouth hole, and differs from a whistle in having finger holes, by means of which different tones can be produced. It is blown at the end like a flageolet, and the three finger holes are placed equidistantly. Four distant tones are easily obtainable upon it, the lowest when all the finger holes are covered, and the other three by opening the finger holes successively.

The *krumong* is made of narrow slabs of wood or stone, which upon percussion with a wooden hammer produce a series of tones similar to those obtained on an harmonicon.

The *busoi* is formed of a bow resting on the ground in a hollow vessel of earthenware or metal, and the string is made to vibrate with a plectrum.

The *klurai* is a wind instrument, constructed of a number of tubes, placed in a calabash with a long snout which serves as a mouthpiece, and which are thus sounded together; chords and combinations of chords or harmony can be produced from it. The finger holes are, some of them, placed laterally, others on the upper surface, and others again on the lower surface.

Singing.—The *pelandai* is the recitative in which the natives pour forth their feelings, their sorrows and disappointments, their desires and ambitions. It is full of feeling, and the voice is modulated to express all its shades. The utterance is slow at first, but is rapid towards the end. There is repetition in redundancy of expression and reiteration. The voice is often tremulous with passion, like the wail of a broken heart—a mournful cadence like the dirge of the dead.

Very different are their war songs. The bard leading the song, chants in a low monotonous solo, his voice rising and falling as he chants of love or war, and is accompanied by the whoops, and yells (fierce, exultant, presumptuous, and cheering) of his companions, and by the clashing of shields and nodding of plumes as the warriors, in their excitement, don their feathers and seize their arms, singing of the deeds of heroes of the olden days and lovely women whose charms gave rise to deadly strife and bloody feuds. These songs have the same effect on the natives of Borneo that the war drum and trumpet-blast have on the soldiers of Europe. The tones of the minstrel are clear, and bold, and tremulous, and culminating at times in a prolonged chorus which the others take up with something like a prolonged yell.

[*To be concluded.*]

MARCH 8TH, 1892.

EDWARD B. TYLOR, Esq., D.C.L., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From the AUTHOR.—Yorkshire Folk-Talk. By the Rev. M. F. C. Morris, B.C.L., M.A. 8vo. London, 1892. pp. xii, 408.

—— Vocabularies of the Tlingit, Haida, and Tsimshian Languages. By Dr. Franz Boas. 8vo. pp. 36.

—— Aboriginal Skin Dressing. By Otis T. Mason. 8vo. pp. 37. Plates.

—— The Development of the American Rail and Track, as illustrated by the Collection in the U.S. National Museum. By J. Elfreth Watkins. 8vo. pp. 58. Woodcuts.

—— Te Pito te Henua, or Easter Island. By William J. Thomson. 8vo. pp. 108. Illustrated.

—— Projet d'entente internationale pour arrêter un programme commun de recherches Anthropologiques a faire aux conseils de révision. By Dr. R. Collignon. 8vo. pp. 11.

—— Estudio sobre el sistema evolucionista. By Emilio Cuervo. 8vo. Bogotá (Colombia), 1891. pp. 73.

From the PUBLISHER.—Marriage and Disease. By S. A. K. Strahan, M.D. 8vo. (Kegan Paul, Trench, Trübner, and Co.) London, 1892. pp. viii, 326.

—— English-Italian and Italian-English Dictionary. By B. Melzi. 8vo. (Hirschfeld.) London, 1892. pp. 608.

From the GOVERNMENT OF NEW ZEALAND.—Statistics of the Colony of New Zealand for the year 1890. Fol. Wellington, 1891. pp. 391.

From GEORGE W. BLOXAM, Esq.—The Ojebway Language. By the Rev. Edward F. Wilson. Sq. Tt. Toronto, n.d. pp. 412.

From the ACADÉMIE DES SCIENCES DE CRACOVIE.—Rocznik Zarzadu. 1889. Pamietnik Wydzialu matematyczno-przyrodniczego. T. 18. Rozprawy Wydzialu matematyczno-przyrodniczego. Ser. ii. Tom. 1, 3.

From the BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. —Report, 1891.

From the GEOLOGISTS' ASSOCIATION.—Proceedings. Vol. xii. No. 6.

From the EDITOR.—The American Antiquarian. Vol. xiv. No. 1.

—— Bullettino di Paletnologia Italiana. Tom. vi. N. 11 e 12.

—— Nature. Nos. 1165, 1166.

—— Revue Scientifique. Tom. xlix. Nos. 9, 10.

—— Science. Nos. 469, 470.

From the AUSTRALIAN MUSEUM.—Records. Vol. i. No. 10.

From the ANTHROPOLOGICAL SOCIETY OF BOMBAY.—Journal. Vol. ii. No. 6.

From the ANTHROPOLOGISCHE GESELLSCHAFT IN WIEN.—Mittheilungen. Band xxi. Heft 4 bis 6.

From the DEUTSCHE GESELLSCHAFT FÜR ANTHROPOLOGIE, ETHNOLOGIE, UND URGESCHICHTE.—Archiv für Anthropologie. Band xix. Heft 4.

From the ROYAL GEOGRAPHICAL SOCIETY.—Proceedings. Vol. xiv. No. 3.

From the ROYAL SCOTTISH GEOGRAPHICAL SOCIETY.—The Scottish Geographical Magazine. Vol. viii. No. 3.

From the ROYAL SOCIETY OF ANTIQUARIES OF IRELAND.—Journal of the Proceedings. Vol. i. No. 8.

From the SOCIÉTÉ D'ARCHÉOLOGIE DE BRUXELLES. — Annuaire. 1892.

From the SOCIETY OF ANTIQUARIES.—Proceedings. Vol. xiii. No. 4.

From the SOCIETY OF ARTS.—Journal. Nos. 2049, 2050.

From the SOCIETY OF BIBLICAL ARCHÆOLOGY.—Proceedings. Vol. xiv. No. 4.

Mr. J. ALLEN BROWN read a paper on "The continuity of the Palæolithic and Neolithic Periods."

Prof. RUPERT JONES, Dr. H. WOODWARD, and Dr. EDWARD B. TYLOR joined in the discussion, and the Author replied.

A paper by the Rev. JAMES MACDONALD on "East Central African Customs" was read.

On the CONTINUITY *of the* PALÆOLITHIC *and* NEOLITHIC PERIODS.

By JNO. ALLEN BROWN, F.G.S., &c.

Introductory.

IT has been generally assumed that a break occurred between the periods during which this country and, in fact, the continent of Europe was inhabited by Palæolithic Man and his Neolithic successor, and that the race or races of Palæolithic folk who hunted the elephant, rhinoceros, cave bear, hippopotamus, reindeer, urus, bison, &c., were completely separated as by a chasm from the agricultural people, the herdsmen with their oxen and sheep, and the tillers of the soil of the so-called Neolithic epoch, implying that man in Britain had changed suddenly from a low savage hunter to a half-civilised farmer and drover.

No physical causes, no adequate reasons have in fact ever been assigned for such a hiatus in human existence, certainly the geologist can offer no evidence in support of it. Some writers have suggested that the man of the drift period was entirely exterminated by the better-armed invading Neolithic race; others suppose him to have become extinct like the tichorine rhinoceros and mammoth, but why he should have fared worse than the reindeer and other creatures who survived, it would be hard to imagine.

The original division of the stone age into two distinct periods may however be accounted for; in the first place, up to the time when M. de Perthes and Dr. Rigollet made the discovery of the earlier relics of man, the stone age was only represented by polished celts and the well marked highly-finished chipped specimens; these formed a striking contrast with the rudely-fashioned pointed and oval implements which at first were found, and for a long time were the only drift forms believed to be of human origin.

Gradually, however, other tools and implements having their analogues in the Neolithic, or surface period, were met with in

the drift gravels and brick earths, and as the contents of caves and rock shelters were examined, it became evident that they were accumulated at different periods, and with minor exceptions long after the deposition of the oldest valley drift of the Thames or the Somme.

Another reason may be found in our want of knowledge, until comparatively recently, of later Quaternary geology—*i.e.* of the origin, formation and sequence of the deposits which followed the deposition of the high level implementiferous drifts, such as the brick earths, head and rubble, and other accumulations which bring down geological evidence to the historical period. The investigations of Professor Prestwich and others have thrown much light on the deposits of later date than the river drift, and with them, as will be seen, the relics of man are associated, together with evidence of the gradual extinction of some animals and the retreat of others.

With these changes came alterations in the types and forms of stone implements, and if the latest are compared with the earliest forms the difference is very striking; but when a large series from different levels of valley drift and caves, and from the surface is studied the evolution of the more recent from the older forms is apparent, and a continuity is evident between them all. The supposed break in the continuity of the stone age in this country is bridged by the discovery of implements of later Palæolithic type and of others which from their form may be regarded as of transition or intermediate age, in some combes and dry valleys associated with deposits of chalk and flint rubble in parts of Sussex, as well as with other accumulations and formations to which I shall refer as being of more recent date than the high level river drifts. The gradual change in mammalian life which appears to have accompanied these higher stages of the stone age will also be considered.

The French and Belgian geologists, whose countries have afforded them much better material for studying this question than we have in England, are divided in opinion as to the continuity or otherwise of the Palæolithic and Neolithic periods. M. G. de Mortillet and M. Cartailhac among others have asserted that a great break exists between them, when the subject is considered from the three points of view of ethnology, palæontology, and workmanship while MM. d'Archiac, Quatrefages, Dupont, Joly, Lazalis de Fondouce, and many others, have stated that there is evidence of continuity between these so-called epochs both as to the fauna and also as to the gradual advance in skill and knowledge of the fabricators of stone weapons and tools. M. Joly asserts there is a direct filiation between the ruder workmanship of the St. Acheul and other

high level drifts and the more skilled handiwork of the Neolithic period.

Although I shall have occasion to mention other localities in which implements of Palæolithic type have been discovered, I wish to draw special attention to the valleys and combes at and in the vicinity of East Dean, near Eastbourne, Sussex, as a district in which during the last few years flint implements have been found (associated with others of later date) which, if they had been met with in river drift and thus acquired the usual gravel-stained surface, would have been undistinguishable from many of the river drift specimens.

The district of East Dean is in a deep chalk valley with a gradual slope from the village of that name to the coast at Birling Gap. The valley widens in several places between the sea and the village, and several narrow transverse valleys lead into it, the general dip of which is also towards the sea. The high chalk hills form an important watershed to these lines of drainage.

At Birling Gap there is a low cliff about 25 to 30 feet high, through which a cutting leads to the beach. The section at this spot has the appearance at first sight of an old river channel extending about 350 or 400 feet in the cliff. This effect is however not due to ordinary river action, but, as will be seen later, to the agency to a large extent of underground water which, penetrating the adjacent hills, finds its way mostly beneath the surface to the East Dean and the other valleys connected with it, and obtains an outlet in the rubble deposits and chalk at Birling Gap.

The section at the Gap shows the following details:—At the top or the surface of the land are broken flints and beach stones with occasional pebbles of old rocks intermixed with argillaceous and chalky matter forming the soil. Beneath this is a very irregular deposit of flints, some of which are broken, but the greater part is composed of a compact mass of sharp and unaltered flint nodules intercalated with light brown calcareous rubble, the component parts of which are slightly rounded by the action of water passing through it; in some places it has a lenticular structure and the deposit has an appearance of bedding, but it is in appearance only. The aggregated flint deposit descends into a bed of yellowish brown slightly rounded chalk rubble in irregular tongue-like and contorted masses ending in scattered flint nodules intermixed with the calcareous debris.

Underlying the curiously massed deposit of flints and chalk

rubble, the latter extending to many feet beneath, is the solid chalk, in which the whole formation rests as in a trough extending up the lower slopes of the hills on each side. It is evident that the massed flint nodules once formed part of the layers of flints now seen in the high cliff to the east.

It is through the calcareous rubble and flint deposits as well as the solid chalk beneath, that the water finds its way to the sea and the drainage of a considerable extent of the adjacent country is effected.

In the upper part of the irregular mass of flints as well as on the surface of the land in this and the neighbouring valleys have been found implements of Palæolithic type to which attention is now drawn.

The nodular bed varying in thickness, extends up the valley to the village of East Dean, and is also found in the valleys which are connected with the main outlet. It has a depth of more than five feet at East Dean Church, but is thicker in other places.

Covering the aggregated flint and chalk rubble bed as already mentioned, there is generally an argillaceous deposit which in some places is a mere trace, but often attains a thickness of 3 or 4 feet or more. This is the result of the long continued denudation of the hills, or matter brought down by rain and snow water. Intermixed with this are the remains of an old drift containing flint shingle with many flattened pebbles, of rocks, foreign to the locality, such as diorite, old sandstone, &c., which probably were deposited at the same time as the boulders and pebbles of old rocks which are met with at Selsea and many other places on the south coast.

Professor Prestwich has suggested that these erratics were transported by ice passing from the North Sea through the Straits of Dover at the latter part of the glacial period, and not by coast ice drifting from the coast of Brittany, which some geologists believe to have been connected in later Quaternary times with that of this country. He includes in the "rubble drift" series: "1st, the mass of angular detritus and rubble forming the head overlying the raised beaches; 2nd, the beds of angular gravel and loam on hill-slopes or projected into the plains at their base and not referrable either to marine, fluviatile, or glacial action; 3rd, the trails of gravel not referrable to river action in subsidiary valleys, ending at their junction with the main valley in a fan-shaped spread of gravel and brick earth; 4th, the basement gravels of most valleys and the stanniferous gravel of Cornwall; 5th, trails in some valleys of blocks of foreign origin; 6th, slight irregular scatterings of angular débris, clay, and loam or brick earth on the sides and at the

base of hills; 7th, the ossiferous breccias in fissures of the limestones of Devonshire and South Wales," and he regards them as having probably been formed *after* the deposit of the raised beaches of the South Coast, &c., which he considers are "contemporary with the lowest and therefore with the newest of the fluviatile drifts of the valley, and consequently that high level gravels are older than the beaches.[1]"

Professor Prestwich believes the rubble drift series, as above divided, to have been formed after a period of submergence of short duration, "the submerged land was again raised—not by one continuous movement but by a succession of uplifts more or less rapid, with intervals of rest or slow movement." This, he says, "would produce on the slopes on all sides of the hills of the submerged area divergent currents which swept down the loose débris with varying rapidity and for varying distances." He does not overlook the effects of denudation and ice action but this preceded by a long period of time the introduction of the rubble drift, "which was the result of agencies independent of and subsequent to any visible exhibition of ice action." "That the disturbance indicated by the rubble drift was accompanied by a change of climate is shown by the circumstance that whereas during the time of the raised beaches sub-glacial conditions obtained and northern fauna survived, the deposits immediately following the rubble drift exhibit no glacial characters and both fauna and flora are of species living at the present day."

The rubble drifts have a wide inland range and to this series is in part to be referred the "head" of De la Beche, the sub-aerial detritus of Godwin Austen, the angular flint gravel of Murchison, as well as the "trail" of J. O. Fisher and the "warp" of Trimmer, &c.

I am unable to agree with Professor Prestwich in regarding the deposits of chalk rubble and head as the effect of submergence with more or less rapid episodes of upheaval, and, like Godwin Austen and other geologists, think sub-aerial action will account for many of the rubble deposits and detritus when accelerated by the cold of the later part of the glacial period and the atmospheric condition of great humidity which probably succeeded it.

Mr. Clement Reid believes "that the erosion of the valleys in the South Downs and the deposition of the eroded material in the form of widespread sheets of angular chalky detritus resulted from the fall of summer rain on a shattered surface of chalk rendered impervious by freezing during a winter of Arctic severity."[2]

[1] Q.J.G.S., vol. xlviii, part 2.
[2] "Pleistocene deposits of the Sussex Coast," Q.J.G.S., vol. xlviii, p. 2.

The valleys at and in the vicinity of East Dean owe their origin, in my opinion, to a large extent to the action of underground waters which falling upon the surface as rain and snow sink into the porous chalk; and only to a very moderate extent finds its way externally on to the lower ground. In alluding to such valleys as that at East Dean, with egress to the sea, Prof. Prestwich has said lines of permanent water level are produced at the base of the hills, variable water levels above, and temporary water levels near the higher parts of the ground, and which are the cause at times of the formation of bournes.

"Under these conditions of the proximity of the permeable strata to the sea, as the inland underground waters are always maintained by the rainfall in the body of the hills at a level higher than the sea level, the hydrostatic pressure" "tends constantly to force the fresh water outward and to stay the influx of the sea water, thus causing a permanent flow of the inland water seaward where it escapes as springs between the tide levels."[1] As he points out, these lines of underground drainage are not level over the same area, but vary according to the unequal density of the chalk itself. This probably accounts for the unequal deposition of flint and calcareous rubble, as well as for the different physiographical features of the same locality.

The second agent which jointly with the flow of subterranean water to the sea has caused the erosion of the valleys and the accumulation of the harder material is carbonic acid, which is contained in rain and snow water.[2] It is generated also in crenic and humus acids. The effect of this solvent is to carry off in solution the carbonate of lime in the chalk, leaving a small residuum of earthy matter; a certain amount of fine calcareous matter is also no doubt conveyed in suspension or mechanically. As a result of these agencies, the chalk is removed and the flints remain, the permeable and soluble chalk is withdrawn and carried to the sea, and the strata of flints are let down and massed together as the work of erosion is continued. This effect is very noticeable at Birling Gap, where in the high cliff to the East the horizontal lines of flint nodules are seen in their original position, while beneath the concrete mass of flints in the valley may be observed the subangular discoloured chalk rubble appearing like an old river bed in the cliffs. I have entered as fully as the limits of this paper will allow into the relative age of these deposits as in it is involved the age of some of the specimens I have to describe.

Although geologists may differ as to the cause of the rubble

[1] Prestwich's "Geology," vol. i, p. 164.

[2] At ordinary temperatures water will absorb its own volume of carbonic acid, but at 32° Fahr. nearly twice its own volume.

and other deposits before mentioned, they all agree in regarding them as of post-Glacial age, and as formed after the deposition of the high level river drift of the valley of the Thames, &c. We might very well therefore, without the discovery of the implements of the old forms at East Dean and in the other dry valleys and combes, regard such deposits as likely to contain flint implements of a period intervening between that of the old river drift and the age of polished stone.

It is of importance to note that the pointed and other implements of older drift form have been discovered in the compact mass of flint and chalk rubble at East Dean, as well as on the surface of the ploughed fields, and with them have been found instruments which seem to be of intermediate forms between the old and new stone epochs, associated with others which certainly belong to a later period.

The formation of a combe or valley by these agencies must necessarily be a very slow process, even though it may have been accelerated by semi-glacial conditions of climate and other causes; the time necessary to remove the chalk above and between the original lines of flints and aggregate them into the unstratified masses in the upper part of which the implements of Palæolithic type have been discovered, must have been great, and may be to a certain extent comparable with the erosion of a valley by ordinary fluviatile action and its infilling with drift.

Mr. Stephen Blackmore, who is employed on a farm near Birling Gap, has for years devoted his spare time to the collection of flint implements from the district; he is a man possessing considerable knowledge on the subject as well as great natural intelligence, and has assured me that he not only has obtained specimens of Palæolithic type from the upper part of the bed of flints in the East Dean Valley, but that he has also found them in the Cuckmere Valley, and elsewhere in the vicinity, under similar conditions.[1]

That there was in late Quaternary times a period during which much of the South Coast was depressed below sea level is known; it is demonstrated by the raised beaches at Brighton and elsewhere, and that it was followed by an uprise and the formation of rubble deposit, in which remains of the extinct Quaternary mammalia have been found, is generally admitted.

[1] It appears hardly necessary to say that these implements which it is suggested may be of late Palæolithic age must not be confounded with the far more ancient implements found by Mr. Hilton of East Dean on the ridge 350 ft. O.D. at Friston, which if not of the Plateau age, cannot be of a later epoch than that of the river drift gravels west of Southampton and the Foreland, Isle of Wight, described by Mr. Coddrington, &c.

During this period of slow upheaval, and for a time afterwards the present seaward valleys extended much further into the Channel than they do now. The subterranean erosion of these valleys has continued in action ever since the last uprise of the land, and would have been in part synchronous with the formation of the chalk rubble or "Elephant bed" at Brighton.

It is probable that the Palæolithic implements discovered just beneath and on the surface at East Dean, and in other dry valleys and combes, have been preserved by the superficial deposits of argillaceous chalky matter, resulting from the denudation of the adjoining hills, which, though it may have been in part carried away by streams in very wet seasons, has yet been sufficient to cover them up in many places in the same way that the compact broken flint and nodular bed has itself been preserved.

There are several dry valleys in Kent as well as Sussex, in which Palæolithic implements have been discovered, among which may be mentioned the valleys in the chalk at West Wickham, described by Mr. George Clinch: they were found on the surface "associated with a stiff ochreous clay," and many of them were partly, or wholly, stained with that deposit. These implements are ovoid and pointed, or tongue-shaped, and there are also "some intermediate forms."[1] "Neolithic" flint relics have also been found in the same localities. The chalk in these valleys is broken up into a rubble and mixed with pebbles, and ochreous clay; the valleys at West Wickham have probably been partly formed by the action of underground water as at East Dean, and the implements of old forms were preserved by the same kind of deposits as in the latter locality.

The valleys at East Dean, and in other parts of the chalk country of Sussex and Kent, must have been occupied by man for a very long period. The out-crop of flints furnished him with the material for his work, and he settled in such places, and fabricated his tools and weapons of flint, which were probably distributed by way of barter with distant tribes.

That this was the case is shown by the enormous number of worked flints which have been found in the valleys and on the slopes of the hills. The fields are literally strewn with flakes and broken pieces mingled with naturally fractured flints, and they are constantly being turned up by the plough.

Among them are specimens, which, if form is to govern their classification, may be properly described as intermediate between the later Palæolithic and the period of polished stone. The number of ground celts found bears no proportion to the chipped

[1] G. Clinch, "Arch. Cantiana," vol. xiv. "Proc. Soc. Antiq.," II, Section xi, 161 *et seq.*

specimens, of which very large collections have been made,[1] though the well-defined Palæolithic implements are also rare as compared with those which appear to be of transition and later date. The extremely rude manner in which many of the implements from the South Downs, near Eastbourne, have been chipped has been noticed by Sir J. Evans.

Among the specimens of Palæolithic type found at East Dean and its vicinity are the pointed forms, some of which are chipped all over, and a few have been met with in which the smooth part of a nodule has been retained for use in the hand; both are comparable with the same forms from the river drift; others are oval, chipped all round the periphery; they were probably mounted with a withe, as double-edged axes, and with them are thick heavy ovoid implements, another drift form, as well as others of Palæolithic type.

One specimen should be specially mentioned as showing the probable continuous occupation of these valleys from the late Palæolithic into the Neolithic period. This is an early drift implement with thick ochreous surface, refashioned in later Palæolithic times. It is a large, probably a broken implement which has been reworked, but so as to retain the cumbrous butt; the point, although rechipped, is characteristic of the earlier period. The newer chipping has a white patina, like most of the other specimens from East Dean with which it was found.

The work in many of the specimens is neater than the general run of drift implements, though among the latter are frequently found implements of pointed type which are beautiful examples of flint chipping. Many of the implements of most ancient type appear to have an older surface than those which are undoubtedly of later date.

As I have already mentioned, there are flint weapons and tools which appear to be of transition or "Mesolithic" forms, between the above and others which are of distinctly Neolithic age. Among the former are the axes or celts; these are neatly chipped all over, and were evidently used like their Palæolithic prototypes from the drift, for fixing in clubs; these more advanced axes have been found in the lower ground (mid terrace gravel) at Acton, at the level of 50 ft. O.D., at Poitou (France) at the same relative level. I have similar specimens dredged from the Thames, and Mr. Lawrence has axes of the like form in his collection. Other examples may be found in the Ethnographical Museum (Pitt Rivers' Collection) at Oxford, from Shrub Hill, Norfolk; many other recorded specimens could

[1] Mr. R. Hilton of East Dean has made a large collection, and I have to thank him as well as Mr. S. Blackmore for furnishing me with specimens, some of which are here represented.

be cited. Rough hewn axes chipped over the entire surface, pointed at the apex and worked to an edge at the other end, are so much like some of the axes from the drift, it is doubtful whether they should be classed among the drift forms or those of intermediate type—several of these are figured in Sir J. Evans's "Ancient Stone Implements." There are also among the East Dean specimens double-edged axes which appear to be of transition age and are similar in form to a large specimen now exhibited, discovered in the brick earth, three or four feet from the surface at Iver, Middlesex, and chipped flat oval implements apparently more advanced than those from the drift, also large convex and concave scrapers with coarsely worked edges. Several spear heads formed from flakes, with a worked depression on each side of the butts for the purpose of securing them to the shafts have been met with; they are all made alike and certainly show a slight advance upon the spear heads discovered by me at the old workshop floor, or working site, of the later Palæolithic age in high level gravel at Acton, where a large number were found—there are other spear or lance heads from East Dean, which correspond closely with some of the latter, *i.e.*, flakes trimmed at the point or sides only.

The axes with a stop-ridge or hump which have been met with at East Dean are, perhaps, more truly of later type, though this form is represented in my collection by coarsely worked specimens of the like shape from the drift of Suffolk, showing the continuity of the same design.

In order to show that the same forms as those from the valleys of Sussex occur in the river drift of the Thames valley, I have placed upon the table in juxtaposition with them a series from the latter; most of them would be undistinguishable, except that the surfaces are mostly white in the one case, and stained by contact with gravel in the other.

A number of implements of the more advanced form of double-bladed axe found at East Dean, &c., show a further development of this ancient weapon, which had its origin in the drift period, or earlier. In these later types there is a wide depression worked between the two cutting edges, evidently for the reception of the bent branch by which they could be hafted. It is remarkable that the hafting of a stone with a bent or split bough, to form an axe or hatchet, or held in the double coil of a withe for the like purpose (in the same way that a blacksmith uses a hazel branch to hold his punch at the anvil) should have been originated in the earliest period of man's history, and have been continued down to our own days among existing savages (such as the Australians, some tribes of North American Indians, &c.), and like certain forms of life, which in distant epochs

were distributed all over the world, are now found only as survivals in isolated places. That this mode of hafting was continued from the Palæolithic into the Neolithic age is shown by the fact that a ground celt was discovered near Oxford with the decayed bent branch coiled round it—it is now in the Ashmolean Museum. The same kind of axe is figured on some of the sculptured Dolmens in Brittany.

There is no doubt that the club with the naturally broken stone, or later, the chipped stone, and still later, the ground celt, shows the like evidence of ancient origin, and of continuity into the present day of another form of axe or hatchet. Two series of specimens are now exhibited, showing the evolution and continuity of the two forms of axes from the Plateau period, through the Drift and intermediate or Mesolithic epochs into the age of metal.

General Pitt Rivers was the first to draw attention to the origin and evolution of many weapons and tools in a series of valuable papers elaborately illustrated published in 1867,[1] in one of which he shows the gradual evolution of the modern iron axe from its prototype in the earliest Stone age.

Flint punches or knapping tools and hammer stones, much battered from use, are often found at East Dean, &c., and the latter, as pointed out to me by Mr. Cunnington, are not simply spherical pebbles, but such rolled stones are selected as have an axis in a definite direction; they have a regularly rounded surface at one end which is comparable with the rounded end of the flaking hammer of a Brandon gun flint maker, while the other, if not already adapted for use in the hand, is slightly trimmed for that purpose; larger cylindrical stones have also been met with which have been worked at one extremity into a flat or plane, which Mr. Cunnington has suggested may have been used as small anvils. I have found stones in the drift which have a flat surface, showing sundry "bruises" which may be accounted for in the same way; the hammer stones of the drift are generally, however, of quartzite.

Small and larger horse-shoe or thumb flints are of frequent occurrence but they are not generally so small and neatly formed as most of the specimens found on the surface. Most of the few ground implements which have been found have been chipped after they have been polished; whether this arose from an indisposition on the part of the makers to devote the time and labour which were necessary to regrind them, or with that conservative clinging to old ways and customs, which is common to all savages, they reverted to their old method, it would be

[1] "Primitive Warfare," by Colonel A. H. Lane Fox, now General A. H. F. Pitt Rivers, "Journ. Royal United Service Inst.," 1867–8–9.

hard to say; in the latter case it would be indicative of the art of grinding having been but recently introduced.

A large number of coarsely chipped rudely spherical implements have been found, about two and a half to three inches in diameter, which exhibit no abrasion whatever and the like forms have been discovered at Cissbury. They appear to be too large for sling stones, which there was, in fact, no need to make, as the stones on the beach would have better served the purpose.

Oval weathered beach-stones, probably intended for this purpose, have been found at Cissbury, where the same kind of globular chipped implements have also been met with. It is difficult to assign a use for them; it is probable they may have been employed when covered with skin with a thong attached as a kind of bolus, or secured in some way to a short staff like the "morning star" of mediæval times, or even as maces when firmly fixed to the end of a short club; in either case a very effective weapon could be easily constructed.

The great difference in the patina of the implements and flakes from East Dean is a noticeable fact. Some of them are porcelainised to a much greater depth than others, and though they are generally bleached there are specimens in which the surfaces have suffered little or no alteration. The greater antiquity of some of the specimens seems to be indicated not only by the greater thickness of the patina but in the pittings or slight erosion of the surface seen in some of the older specimens, an effect probably due to such solvents as humus or crenic acids acting during a long period. Almost all the relics of human handicraft appear to have become entirely bleached before they have been scratched by the plough or other agricultural implement, but some specimens have a peculiar rubbed or scratched appearance, as if they had been used for planishing or smoothing.

Mr. E. H. Willet discovered a pointed flint implement of Palæolithic type weathered white, and with a slight patina in the combe rock pit near Portslade, near Brighton, associated with the teeth of the elephant and a tooth of rhinoceros tichorinus. It was found at the depth of 15 feet from the surface, and is described as being very like some of the implements from the Somme.[1] Of the deposit in which it was found Professor Rupert Jones says:—"Two uneven jagged lines are seen to traverse the chalk rubble mass. These may be produced by water action, but the fainter line above may be referable to infiltration of surface waters." Another was found near East Withering with bones and fresh water shells; the age of the deposit is, however, doubtful.

[1] Dixon and Jones' "Geology of Sussex."

As the fauna of the rubble beds, head, &c., is an indication of the age of the flint implements which have been found associated with them it is of importance that these, the last accumulations since the period of the high level river drift, should be considered.

Fossil bones have been found in the flint and rubble deposits in the valley of East Dean and also at Cuckmere, but they have not been recorded in any publication. At several places at and in the vicinity of Eastbourne the remains of Quaternary mammals have been also discovered in calcareous rubble and flint deposits. Dr. Mantell has described the bones of hippopotamus, mammoth, and deer from that locality. In digging the foundations of the Town Hall at Eastbourne similar discoveries were made; the Caldecott Museum there contains many specimens.

Murchison refers to the discovery of Elephas at Wiggenholt. Whether, as Professor Prestwich suggests, rubble drifts are in part due to semi-glacial action or not[1] it is evident, as he says, that they have been formed after the deposition of the raised beaches, and their deposition must have proceeded synchronously with the later stages of the erosion of the valleys. A well-known instance of the formation of detritus, composed of calcareous rubble and flints, is the thick deposit above the elevated shingle at Brighton. According to Dr. Mantell it attains a thickness of from 50 to 60 feet, and in it have been discovered the bones and teeth of Elephas primigenius and Rhinoceros tichorhinus low down in the deposit, and at various depths, Equus fossilis, E. plicidens, Bos, Cervus, Asinus fossilis (Owen), &c. Dr. Mantell mentions the discovery of a similar assemblage of fossils at Patcham in the same kind of rubble bed. Murchison refers to the teeth of the mammoth as being found in the lower ground of the cliff range (80 to 110 feet) at Folkestone, in a detritus of broken chalk and flint, and alludes to the exhumation of portions of the tusks of the same animal from beneath 15 feet of the like deposit in the lower part of the cliff towards Shakespeare's Cliff, near Dover. In the valley at the back of Dover castle and at the depth of three or four feet from the surface I have found flint flakes intermixed with chalk rubble. To show the continuity between the Quaternary and the existing fauna found in such calcareous deposits, I may mention that the remains of red deer have been found under the like conditions near the barracks at Brighton and also at Copperas Gap, near Hove. Many other instances show the varied character of the mammals which have been discovered in beds of chalk rubble and flints. It is unnecessary to refer to deposits of rubble and head out of the chalk district, in which the remains

[1] "Q.J.G.S.," vol. xlviii, p. 2.

of Quaternary fauna, &c., have been discovered. The contemporaneousness of Man with the formation of the mud deposits (of Dixon) at Thorney, Selsea, Bracklesham Bay, Bognor, Littlehampton, Worthing, &c., in which remains of mammoth have been found, is generally admitted.

It is indisputable that many of the now extinct Quaternary animals lived on into the period when the rigours of a glacial climate were succeeded by more temperate conditions; that some of them existed even into historic times will be seen later. The flint implements discovered at Birling Gap and other places, carry the sequence of the Stone age from the drift period into that of polished stone.

The flint instruments found on the surface and in the old mining shafts at Cissbury are in many cases similar in type to those found at East Dean, and, as General Pitt Rivers and others pointed out many years ago, a large number of implements of the same form as those found in the drift have been discovered in these ancient excavations. Others which I have obtained from Cissbury appear to be of intermediate type; no polished specimens have been found in the shafts, though a ground axe has been met with on the surface, which is probably of later date. The remains of urus are said to have been found in one of the pits with wild boar. It is probable that these flint mines are much older than the fauna discovered in them would appear to indicate. Comparatively few of the shafts were re-excavated. The bones buried in them were not numerous and many of them were no doubt entombed at dates far more recent than when the earliest shafts were sunk by the flint workers.

In the old mining workings and manufactory at Spiennes in Belgium described by MM. Briart, Cornet, and Houzeau de Lehaie and also by Rev. Magens Mello, we have a similar assemblage of implements. Although some of the specimens are carefully chipped into shape none of them present, as the latter says, "the wonderfully elaborated forms and the delicacy of the Neolithic weapons, &c., from the Danish tumuli and they probably belonged to an earlier stage of the Prehistoric period." Polished implements are rarely met with there, and such as are found are often rechipped showing *primâ facie* evidence of a retrogression, "whilst there are a few which bear a resemblance to the river drift forms, broad at one end and pointed at the other;" others are like rudely chipped axes of the Danish kitchen middens.

The former appear to me to be of transition or Mesolithic type and taken in conjunction with other accumulations of the Stone age, there seems to be a direct filiation or derivation, as M. Dupont suggested, between the implements found at Spiennes, and the like forms, with the remotely connected drift specimens

found in the gravels, which the later people penetrated to reach the chalk in their search for flints.

The working sites at Pressigny le Grand, Charroux in Poitou, and many others, furnish the same kind of evidence.

Evidence afforded by Caves and Rockshelters.

The contents of caves and rockshelters have furnished remarkable evidence of the continuity of the existence of man in North West Europe, if they are studied collectively; but when they are considered individually that evidence is not so apparent, although, as in some instances to be noticed later, there are caverns the contents of which appear to show they have been occupied continuously by Palæolithic people as well as by their so-called Neolithic successors. Caves have been inhabited by man throughout a vast period, and it is very unlikely that the same cave or rockshelter should have been continuously occupied into the later stone period. Man of the latest or polished Stone Age had ceased to be a troglodyte, he built houses of wattle, earth, and large stones where he could get them, and he fortified the hill tops with ramparts and fosses within which the tribes withdrew with their cattle when in danger, and he raised chambered tombs covered with earth over the dead; the most we can expect to find in caves and rockshelters is evidence of man's existence between the later stages of the drift period and of that which immediately succeeded it, and this is exactly what we generally get in such old sites.

Before this subject is considered, however, it would be well to mark the progress which had been made in the drift period itself. The oldest implements in the high level river gravels are either formed from nodules, naturally broken stones, or coarse flakes struck off without any method; very often they have suffered much abrasion, and often have a thick ochreous patina; these are always found near the bottom of the deposit. Whereas in the uppermost part of the beds of the high level drift, the weapons and tools are often formed from neatly made flakes skilfully struck off a *prepared* nodule. Long spear-head flakes afterwards carefully trimmed—effective borers, scrapers, both concave and convex, knives worked in double curves or with a slant at the point like many pen-knives of to-day, axes and other implements, are thus produced; the tools and weapons are differentiated, and contrast with the simple combined tools and weapons of the early Palæolithic folk.

Human progress is particularly marked by the discovery of an improved method of working the material. A vast period elapsed before man discovered the way to strike off long thin

flakes; to produce them, the nodule had to be first prepared and shaped as the gun-flint workman prepares his blocks of flint, and in detaching the long flakes the same skill as he shows had to be employed; any one who has tried to make long flakes will know how difficult it is to do so without adopting the same method of striking and using the rounded hammers, &c., with which he works, instead of which suitable stones must have been selected in the Stone age for the same purpose.

The flakes thus struck off, were thinned at the butts, and could be trimmed and secured to shafts as spears; this thinning out at the butt could only be produced by well-directed blows immediately behind the point of impact of the last flake. Knives and other implements could be formed in a similar way.

Under six feet of deposit at the higher part of Acton I discovered on a "Workshop floor" an assemblage of such spear heads and other tools and weapons all formed from flakes, and I have found the same in many places in the Thames Valley two or three feet beneath the brick earth, which appear to correspond in age with those from the old working site at Acton.[1]

Such trimmed spear-head flakes often six inches in length, pointed by secondary work, are exactly like the stone spear heads of the natives of the Admiralty Islands, Australians, &c., and they show a great advance in effectiveness and skill beyond the coarsely worked nodule or rude flake of the men of the early drift period. In some of those found at Creffield Road, Acton, an approach to a stem was observable in many specimens.

Mr. Pengelly in his investigations at Kent's Cavern, has alluded to the advance shown in the implements formed from flakes and those made by working on the nodule, and it is important that this advance in the method of working flint should be alluded to before considering the contents of caves and rockshelters, as it is invariably observable in cave deposits of later Palæolithic age.

Caves and rockshelters, &c., have been classified, for the most part, according to the relative antiquity of the osseous remains found in them. Many of the less ancient of these dwelling-places would not have had so high an antiquity assigned to them but for the occurrence in them of the bones of the mammoth, bison reindeer, &c., the absence of which is are supposed to mark the close of the Quaternary age. If the flint weapons and tools contained in some of the caves in the Dordogne had been met with at or near the surface of the ground in England, or had been dredged from the Thames, they would in this country have been included within the limits of the Neolithic period. It may be

[1] See "Palæolithic Man in N.W. Middlesex," &c. J. Allen Brown.

useful to quote M. Lartet's division of the life periods of the later Quaternary mammalia into four divisions based upon the extinction or disappearance of certain species which has been generally accepted, with the exception that according to some English geologists, the rhinoceros tichorhinus should be placed in the oldest list.

1	2	3	4
Ursus spelæus *Hyæna spelæa* *Felis spelæa*	*Elephas primigenius* *Rhinoceros tichorhinus*	*Megaceros hibernicus.* *Cervus tarandus.*	*Bison priscus.* *Bos primigenius* (*Urus*).

With these outgoing groups should also be considered the gradually increasing numbers of the existing fauna, the wolf, fox, hare, badger, brown bear, &c., but it is more particularly in the survival of the last two divisions and the mammoth into a later period than what is generally understood as the Palæolithic Age, that the continuity of man's existence can be shown.

Kent's cavern contains human relics associated with the remains of mammals extending over an enormous period. The stages of human progress, as indicated by flint implements, are marked off by calcareous deposits which leave little doubt as to their relative age or of the sequence of the animals with which they are associated. In the lowest or breccia deposit and crystalline stalagmite, were found flint implements of the old drift type, and like the earliest drift specimens, they are formed from nodules rudely chipped into the required forms. These are associated with the remains of machairodus, the cave bear, (*Ursus spelæus*) and traces of *Felis spelæa*. Those of later date discovered in the cave earth above the breccia deposit were formed from flakes and were very numerous, and of a higher type; with these were remains of the cave hyæna, wolf, fox, glutton, badger, cave, grizzly, and brown bears, rhinoceros, horse, urus, bison, Irish elk, red deer, reindeer, mammoth hare, &c., the cave hyæna being, as may be expected, the dominant form. For the figures of these implements formed from flakes, see "A. S. Implements," Figs. 390, 391, 392 (the latter figure, as Sir John Evans says, is not unlike implements of the surface period), 393, 394, 395, 396. Of 397 he says, "there is little or nothing to distinguish it from the analogous implements of the Neolithic period," and they have been found in the French caves of much later age than that of Le Moustier. Mr. Pengelly has written of these implements fabricated from flakes, that they were made by "a race farther advanced in civilisation" than those found in the breccia deposit. Some are in form and character Neolithic, others are exactly like those transition or Mesolithic types of which I have obtained a large collection from Birling Gap and

its vicinity. The black band (the hearth of the cave men) below the granular stalagmite, and to a small extent intercalated with the cave earth, yielded 366 flint implements, flakes, and chips, besides bone implements, associated with remains of ox, deer, horse, badger, bear, fox, hyæna, and rhinoceros. The mixed character of the fauna is noticeable in this, as in the cave earth deposit. Above this was found a miscellaneous collection bringing the sequence into the polished stone and bronze periods and thence into the historic period, as seen by the objects discovered, *i.e.*, polished celt (McEnery), bronze socketed celt, spindle whorls, bone chisels, Roman and pre-Roman remains, &c. The animal remains found in association with them were brown bear, fox, badger, red deer, short fronted ox, sheep, &c.

Brixham cave has furnished but few implements and they are generally associated with the same fauna as Kent's cavern except the machairodus, of which a single tooth was found in the latter.

Here also we have an implement of drift type discovered in the oldest portion of the cave and in other parts implements formed from flakes, one of which Fig. 410 ("A. S. Implements") appears to be of much later date than the specimen for use in the hand ("A. S. Implements," Fig. 409), others like ("A. S. Implements"), Fig. 412, is a small horse-shoe scraper or "grattoir," a form which has been met with in some of the caves in France, and is of a type commonly found on the surface in England.

In the caves of Creswell Crags explored by Professor Boyd Dawkins and the Rev. J. Magens Mello, we find remains of a group of animals associated with stone implements of different dates. Taking the Pin Hole, Robin Hood, and Church Hole caves together, we have the spotted hyæna as the dominant animal, and its victims the grizzly bear, wolf, common fox, bison, reindeer, Irish elk, horse, woolly rhinoceros, and mammoth. The middle cave earth of Robin Hood Cave contained an enormous quantity of the bones and teeth of animals introduced by the hyænas with implements of flint and quartzite, a few of which are undoubtedly of early Palæolithic type (as Figs. 43, 44, 45, "Early Man in Britain"), but in the upper cave earth they are of later Palæolithic date; they are more highly finished articles of flint (the material brought from a distance) such as lance heads, trimmed flakes, and a flint borer, with simple and double scrapers. In a similar deposit (the upper cave earth) at Church Hole, were discovered bone implements and fragments of a rib bone with an incised figure of a horse. It is remarkable that in the Robin Hood cave a tooth of machairodus was found in the upper cave earth along with the more common animals,

and with flint implements, which if form and workmanship are to govern their classification must be regarded as of late Palæolithic if they are not of transition age.

Professor Boyd Dawkins has come to the conclusion, as the result of his exploration of these caves, "that in the two lower stages the hunters are identical with those of the river drift, while the more highly finished articles, which imply a higher and probably a different social position, appear in the upper series."

In concluding this cursory view of the evidence afforded by English caves, I should mention that Sir J. Evans says, "Although in some instances the river drift and cave deposits belong apparently to the same period, yet in others it seems probable that we have in the caves, relics derived from a period alike unrepresented in the old alluvia and in the superficial soil; and which probably belong to an intermediate age, and assist to bridge over the gap which would otherwise intervene between the river drift and the surface period, although he did not consider that such good evidence of a sequence in the order of deposition of their contents can be observed as in the caves of the South of France and Belgium." It is noteworthy that Dr. Stevens, who was the first to discover flint implements in the high level drift at Reading, says that they have been deposited at such widely different periods and under such a variety of circumstances that we cannot be surprised if they approach the Neolithic forms.

In the caves and rock shelters of France and Belgium we have the strongest evidence of gradual advance not only in the art of chipping flint, but also of increased specialisation in the forms into which the material was worked; the dominant type of the old drift, the pointed implements formed from pebbles or flint nodules, intended for use in the hand, "claw-like, &c.," and the few rude hatchet-like and other simple instruments are passing away—in fact the "*coup de poing*," the implement for all uses, can hardly be said to be represented in the caves of the Dordogne, and it is replaced by implements made from flakes. The instruments from the most ancient of the groups of caves to which M. de Mortillet has given the name of Le Moustier are represented in the latest stages of the high level river drift (Acton working site, &c.), and they are also fabricated from flakes struck off the nodule and not (perhaps with a few exceptions of flattened pear shape) by working on the nodule itself.

M. de Mortillet has divided the Palæolithic period into four stages:—1st, the *Epoque Chellienne or Acheuléenne*, which applies to the remains found in the higher level river drift; 2nd, the *Epoque Moustierienne*; which includes the contents of the cave

of Le Moustier and some other caverns both in France and Belgium, and later river deposits; it is marked by the occurrence of large broad chopper implements formed from flakes—long and broad flakes worked by secondary chipping into spear heads and other forms, "râcloirs" or side scrapers and other instruments, all characterised as being formed from flakes; similar choppers have been found at High Lodge, Mildenhall, and elsewhere.

M. de Mortillet's classification is largely based on the improvements observable in the weapons and tools of man, and the fauna with which they are associated; but the divisions are not sharply defined, and doubts have been reasonably expressed whether the next class should not be placed at the end of the series. With the flake-formed implements of Le Moustier were found remains of the mammoth and hyæna more abundantly than in the succeeding divisions, but they were associated with the bones of other animals, including the reindeer.

The third group classified as the *Epoque Solutréenne*, which includes the station of Solutre and the cave of Laugerie Haute, one of the caverns in the Gorge d'Enfer, Grotte de L'Eglise, all in the Dordogne, &c., is remarkable for a great advance in the form and workmanship of the specimens, especially those made from long flakes; among them are delicately chipped lance heads, well made lozenge and leaf shaped arrow or small spear heads which are quite equal, as far as workmanship is concerned, to those of similar forms which are classed as Neolithic or surface implements in England. One of the types which characterises this epoch is the "pointe Solutréenne," *i.e.*, long slender flakes worked to a willow-leaf form with a lateral notch at the butt, thus forming a tang or stem at the side for insertion into the shaft or handle, beautifully made piercers, "grattoirs" or scrapers rounded at one or both ends as distinguished from "râcloirs" or side scrapers, and also axes and other implements which resemble in a marked manner many of the implements found in the valleys of Sussex, Kent, and elsewhere. The knives and spear-heads tanged at the side have been dredged from the Thames.

The fauna in this division varied, and the abundance of the remains of the horse in the open air station at Solutré is a remarkable fact; the number of horses there has been reckoned at more than 10,000 (Joly), and the bones form a wall round the principal enclosure. It seems difficult to believe that such a vast accumulation can have resulted from the animals being killed for food; with them, however, were found remains of reindeer and the mammoth. In other caves and stations of this epoch, the remains of the former predominated, and in

company with these relics were the bones of many other animals, including besides the teeth of the mammoth, bones and teeth of Felis spelæa and the Irish elk.

The fourth division, L'Epoque Magdalenienne, comprising the caves of La Madelaine, Les Eyzies, Laugerie Basse, and others in the Dordogne, as well as similar caverns and shelters at Bruniquel, Massat, La Vache, &c., in France, and others in Belgium, is a group which has furnished abundant and interesting evidence of human progress in the number of works of art, such as incised and sculptured bones, ivory, and reindeer horns; this division is characterised by long, many of them very slender flint flakes, which have been converted by neat secondary work into knives, saws, piercers, gravers, and other instruments, but they do not show so much skill in workmanship as those of the age of Solutré. The "racloirs," or side scrapers disappear and are replaced by "grattoirs," or flakes chipped at the wide end, a type which is often found near the surface in Sussex and elsewhere, and which appear to be akin to the horse-shoe scrapers or "thumb flints." The lanceolate forms are all chipped on one face only, and not on the flat part of the flakes, but they differ from the leaf-shaped lance heads from Laugerie Haute, &c., in not being nearly so beautifully made.

The remains of reindeer were most abundant in this group of caves, &c.; those of mammoth very scarce; but the horse, wolf, fox, and hare, wild boar, bison, &c., are strongly represented. The mixed character of the fauna is seen also in the occurrence of the remains of the reindeer with the roe, in the cave of La Madelaine. Some bones of the cave tiger were met with at Les Eyzies, but those of the cave hyæna were absent.

The age of Cro-Magnon, which includes the well-known cave of Aurignac, Grotto des Fées, and numerous others, appears to be intermediate between the last two groups; part of an elephant's tusk was found at Cro-Magnon, and remains of rhinoceros at Aurignac, but in all the horse was more predominant than reindeer. M. Lartet based his opinion of the antiquity of the cave of Aurignac upon the occurrence of the bones of the cave bear and cave hyæna[1]; the remains of the bison, wolf, and the roe and stag were also discovered, but the fox was the most abundant animal whose bones were found. Associated with these were flint lance heads not so skilfully made as those of Solutré, hammer stones with central depressions, perforated and engraved reindeer horns, &c.

MM. Hamy and Quatrefages have referred the human relics of the last two epochs or divisions to the same race of people,

[1] "Sur la coexistence de l'homme and des grand mammifères fossiles," "Ann. Sciences Nat.," vol. xv.

i.e., to what they have designated the Cro-Magnon race, of whom the latter says, "They must have known both the latest times of the reindeer age and the earliest of the present epoch."[1]

Among the figures engraved on a portion of antler discovered at Laugerie Basse (Magdalenien period) is a naked man stalking a bison according to M. Massenat, but the victim is considered to be the Urus by Prof. Boyd Dawkins, on account of the double curvature as well as the length of the horns; this suggestion may be indicative of the abundance of that animal at that time.

The caves and rockshelters of La Madelaine, Les Eyzies and Laugerie Basse, and others forming the Magdalenien group bring the long Quaternary period to an end according to many French geologists, though nearly all the animals now living were then existing or are but slightly modified descendants of Quaternary species. The Machairodus, Ursus spelæus, Hyæna spelæa, and Felis spelæa, Rhinoceros tichorhinus, Elephas primigenius, and Megaceros hibernicus have become in succession extinct; the reindeer, musk sheep, and glutton, &c., have migrated towards the north; the saiga antelope has reached the east, and the hippopotamus, hyæna, &c., have gone south. Some of them, as will be seen later, seem to have disappeared in historic times, but whether this be so or not, we may be very sure that certain species lived on into the Neolithic age, if not into that of bronze. Most of them have been destroyed, like the American bison of to-day, by the hands of improvident man; he increased in numbers as a more genial climate than that of the early Quaternary period prevailed, and many of the later surviving animals fled before him or were killed off. It is remarkable that some of the French caves have furnished evidence of these altering conditions; the researches of Dr. M. J. Parrot show that some of the caves and rockshelters of the Valley of the Vezere, Dordogne, cannot be classed with any of the divisions of M. de Mortillet.[2] In these a series commencing with similar flint implements to those of Le Moustier, a stage appears to be reached later than that of the reindeer period, which is characterised by much more highly finished lance and arrow heads, and saws, with weapons and tools of bone.

We can hardly expect to find many instances in which caverns and rockshelters have been continuously occupied by man from the early Palæolithic period with its changing fauna, and the early Neolithic epoch which preceded the time when polished stones began to be used, the fauna of which is necessarily but little known, as such relics are not generally preserved at or near the surface. There are, however, some caves in the

[1] "Précis de Paléontologie Humaine."
[2] "Revue d'Anthropologie," t. iii.

Pyrenees which have been inhabited by successive peoples, and which appear to show a continuity between the two stone periods. Among these is the cave of Gourdan, Pyrenees, described by M. Piette. The rockshelter of Duruthy, near Sorde, Bas Pyrenees, explored by MM. Lartet and Chapelain-Duparc,[1] who give evidence of the former existence of a human race associated in Périgord with the mammoth, the cave-tiger, and the reindeer, first in the age of triangular bone arrow-heads (Cro-Magnon age), then in that characterised by barbed bone arrow-heads and representations of animals (age of La Madelaine, &c.), which, as M. Joly says, "after manifesting itself in the fully artistic phase at the bottom of the cave at Sorde, is found again towards the upper part of the same cave, with flint weapons, which from their finished form and rudimentary polish might almost be classed in the age of polished stone and rude pottery." Human bones were discovered in both the distinct strata, though in another bed they were intermixed, thus showing a continuous human history into a stage more recent than the Magdalenien epoch.

The cave of Mas d'Azil (Ariège) affords the like evidence, and in that of La Vache in the same valley, the age of polished stone and the reindeer period are equally represented. Nowhere, says M. d'Archiac, are the elements of a human chronology to be found in so complete a form as in this valley.[2]

The Cave des Fées (Yonne), explored by M. de Vilbraye, is also an example of a cavern wherein is found evidence of successive periods reaching down to a late date. In the lowest deposit were discovered the remains of the older fauna (cave bear and hyæna, &c.). In the middle layer those of the reindeer and other animals, and in the upper deposit (loess), bones of animals still living in the district (fox, badger, &c.). In the Trou du Sureau (Belgium) were found deposits, showing it had been occupied by man and other mammals at successive times up to a late period. Overlying the older remains were discovered the bones of reindeer, wild boar, goat, badger, fox, hare, &c., which have been assigned to the latest part of the reindeer period and with them flint implements formed from flakes, &c. Analogous facts have been noticed at the Cave of Pontil (Herault), explored by M. Gervais; at Salleles-Carbardès by M. Filhol; in Poitou by MM. Brouillet and Meilles, &c. The Grotte du Placard (Charente), examined by M. de Maret, points in the same direction.[3]

[1] L. Lartet et C. Duparc, "Une sepulture des anciens troglodytes," Paris, 1874.

[2] "D'Archiac Faune Quaternaire."

[3] "Le Musée Prehistorique," G. de Mortillet.

The cave at Mentone wherein the human skeleton was discovered, is said to have contained flint and bone implements of three different dates; that of Le Moustier, La Madelaine, and of the polished stone age with bones of the cave bear, hyæna, &c. (Joly).

Sufficient has been said to show that the stone implements of man evincing greater specialization in form and involving greater skill as time has passed, have accompanied the gradual extinction in succession of the great cave bear, rhinoceros, mammoth, urus, bison, &c., and in the probably slow migration of the hippopotamus, hyæna, reindeer, &c. At the same time, it should be borne in mind that the chronological sequence based on the remains of animals found in caves and rockshelters is not entirely satisfactory, for as Professor Boyd Dawkins says, "The hunters in each district would live on whatever animals they could catch, and the abundance of reindeer in one cave as compared with that of horses or cave bears in another implies merely a local variation in the fauna," and both he and M. de Mortillet believe that no classification based only on the mammalia is possible. As the former says an Esquimaux camping ground is in one spot covered by the bones of walrus or seal, and in another with the remains of musk sheep and reindeer.

If the remains of the changing fauna which accompanied the recent geological changes involving minor alterations in the surface of the land in the chalk and other districts, could have been as well preserved as the contents of caves and rockshelters, we should have had further evidence of the gradual extinction in England of such of the Quaternary Mammalia as have passed away, and parallel with these changes the slow development of the stone weapons and tools of man into various forms more adapted to his increasing wants, than the few simple types which indicate the state of human art in the earliest stage of the Palæolithic period.

According to Steenstrup, remains of reindeer have been found in the kitchen middens of Denmark associated with cervus elephas, the wild goat, and wild boar, brown bear, wolf, fox, lynx, beaver, marten, otter, walrus, seal, the great auk (lately extinct), &c., and the dog which is believed by Steenstrup, to have been then domesticated. The long oval implements from the "middens," the form of which appears to have been evolved from a *late* drift type, correspond closely with some of the specimens discovered at East Dean, Cissbury, &c.; the axes, which are flat on one face, and convex and sometimes partly ground on the other, are of a peculiar character, and are far less advanced than the polished celts found in this and other countries. According to Warsaë, these refuse heaps represent the

beginning of the age of chipped stone in Denmark: other archæologists assign them to the period of the earliest Dolmens.

The reindeer has been driven further north within the historic period; there is great probability that it had not entirely disappeared in Great Britain in the polished stone age; though rare and perhaps doubtful in England, its remains, according to Dr. J. A. Smith,[1] have been found more abundantly in Scotland. Prof. Boyd Dawkins says they have been discovered in peat near the Thames, at Erith, with the beaver, Celtic shorthorn, goat and horse at the bottom of the deposit and also under similar conditions in the excavations for the Victoria Docks[2] and along with the moose or true elk, Celtic shorthorn, &c., at Walthamstow.[3] Among other places in Scotland, the reindeer is said to have been met with in the refuse heaps of Caithness. Prof. Boyd Dawkins states that it is comparatively abundant in the peat bogs and marls of Ireland. MM. Roujou and Julien found in peat deposits near Paris, which are believed to date from the reindeer age, flint implements and other objects which they consider to be of later date than the period of the mammoth but more ancient than that of polished stone.[4] Cæsar is said to have hunted the reindeer in Belgic Gaul.

The mammoth is believed by many writers to have survived in Europe to a latter date than is usually assigned to it. Prof. James Geikie ("Prehistoric Europe") has suggested the possibility of its having migrated with the reindeer and afterwards reappeared in Great Britain, and of its having existed to a still later date in Siberia where its complete carcases have been found in frozen ground. The great pachyderm appears to have survived down to the period of the formation of peat and the later alterations of the coast line in this country, as two perfect heads of the animal were found in a peat bed, near Holyhead, and a peat stained molar was discovered in the submerged forest at Torbay (later forest bed deposit).

As we have mentioned its remains have been met with in rubble beds in Sussex, &c., associated with flint implements of probably much later date than the old river drift. Neither Lyell, Dr. Falconer, nor Mr. Pengelly seem to have doubted that the mammoth survived down to the period when the late extensions of the coast line of this country existed. M. Dupont also thought that it lived in Europe to a later period than is generally believed.

[1] "Proc. Soc. Antiq. Scot."
[2] "Early Man in Britain."
[3] "Geol. Magazine," vi, 339.
[4] J. Geikie, "Prehistoric Europe."

Remains of the great Irish elk have been discovered at the base of the peat bogs in Ireland, and they have also been found though more rarely in England and Scotland; the moose or true elk has also been met with in peat beds.

The urus (*Bos primigenius*) may very well have survived into the polished stone or Neolithic age and probably to the earliest metal period. Its remains have been found in many places which indicate such a survival; among them may be cited a pile dwelling in Barton Mere, near Bury St. Edmunds,[1] in connection with which its bones have been found. Mr. E. Willet is reported to have discovered them in one of the shafts at Cissbury.[2] Although much larger than our domestic oxen, it is believed to have been specifically undistinguishable from the ox of to-day (*Bos taurus*). Lartet and Christy, and others, state that the urus was hunted by the Emperor Charles the Great in the central forest of Germany, while some writers have asserted that it lived there until the sixteenth century. Darwin considered the Chillingham cattle as its half tamed descendants, others have suggested that the large Caledonian ox is derived from it. The later ox (*Bos longifrons*) survives in our domestic breeds.

The auroch or bison appears to have lived into historic times in Europe, and a few survivors are believed to have recently existed if they do not still live in the Caucasus. It is known that herds of bison are preserved in the forests of Lithuania by the order of the Czar.

There are no indications that the fauna which accompanied man passed through such a vast period as is comprised in the Quaternary without undergoing some modifications, or that the few species which have become extinct were swept out of existence by some cataclysmic disaster, which included in its action Palæolithic man, and spared the 31 species of mammalia which Prof. Boyd Dawkins says survived into the Neolithic epoch out of the 48 which lived in the Quaternary age, the remaining 17 being accounted for by the migration of 12 and the extinction of 5 only.

Modifications, extinctions, and migrations have occurred from the earliest geological times, but these changes have taken place slowly, and so it was in the Quaternary period, the species which died out disappeared gradually and in succession. The same thing happened in regard to the migration of the reindeer and other animals, they gradually retreated to latitudes more suited to their existence as the climatic and other conditions

[1] Boyd Dawkins, *op. cit.*

[2] It is said the Urus still inhabited the Hercynian forest and the woods of the Vosges, &c., in the time of Cæsar (Joly).

changed, from those of a temperate pre-glacial period to the glacial epoch with its probably long continued inter-glacial and semi-glacial episodes, of which the fluvio-glacial character of the highest river drifts affords evidence, until slowly the more equable climate of the present day succeeded.

The forests and woodlands which covered so much of the British Isles at the dawn of the historic epoch, contained the survivals of the mammals of the Quaternary period, and among them may have existed the urus, and perhaps in Scotland a few reindeer, of modified species.

The facts, although far from fully gathered together in this paper, show that man was living in England and North West Europe in company with the quaternary mammalia in unbroken continuity, and that he was present throughout all those changes, which mark the extension of the quaternary into the historic period. There appears to be no adequate reason for separating the stone age of human art into two periods, but as I have endeavoured to show when the discoveries in river drifts of different levels which are taken to indicate different periods, are considered, and when the contents of caves and rockshelters, peat beds, &c., are studied as a whole, they afford sufficient evidence of human progress in the art of working flint from the remote period when the broken pebbles and rudely chipped nodules which have been found by Mr. B. Harrison and others upon the high ground or plateaux of Kent and elsewhere which perhaps indicate the lowest level of human art, to the deposits of the oldest river drift of existing valleys, where the few simple forms of the flint implements made from nodules and pebbles showing but little specialization, but, nevertheless, marking an advance in skill, are succeeded by river drift implements formed from neatly made flakes, corresponding in advance with the like objects found in the caves of Perigord, &c. As already mentioned the discovery of manipulating flint so as to produce long and short neat flakes at will, which could only be done by the methods now employed by the gun flint maker, marks a most important advance, since the weapons formed thereby were much more effective and the tools admitted of greater variation and differentiation as the wants of man developed. It is remarkable, too, how many of the chipped stone spear heads of certain savage races correspond with the old ones, and how their stone knives still exhibit the same curved form as is found abundantly among the drift specimens; to show this I exhibit a sketch of a curved knife of glass obtained from a tribe of natives of Australia, and now in General Pitt Rivers' Ethnographical Museum at Oxford, and a number of like specimens from the drift.

With regard to the implements hitherto classed as of the

surface period or Neolithic. Sir J. Evans says, "It is almost demonstrable that some of the chipped celts which have hitherto been classed as Neolithic must be among the earliest of the Neolithic implements," and "must in all probability date back to a very distant period." It is to these forms which appear to be of transition age, that I would apply the term Mesolithic.

In conclusion I should like to draw attention to the unsuitability and indefiniteness of meaning of the terms Palæolithic and Neolithic into which the stone age is divided in England—in the light of recent investigations and discoveries—the word Neolithic in its present acceptance is particularly misleading and uncertain in its application; it was at first applied to the age of polished stone, but was afterwards used to denote the period when the few species of mammalia before alluded to had become extinct, and the reindeer and other animals had migrated finally from this country, and it has been generally adopted as referring to stone implements found at or near the surface of the land when the sheep had been imported and other animals had been domesticated. As a fact, however, we do not know whether some lingering survivors of the former were not living in Great Britain far into the latter part of the Stone age, nor can we apply the term to flint implements which are found associated with geological accumulations formed at a latter period than the old river gravels, when we may fairly assume that the zoological changes referred to had not been entirely completed. It certainly is not applicable when the forms of the stone implements intermediate between the late Palæolithic and those of the latest stage of the age of stone are studied, and the corresponding advance in art or the progress of man is detected.

At present some flint implements, which from their form would be ranged under one of the later Palæolithic groups by M. de Mortillet and the French geologists, would be included in the second division, or Neolithic, in England. A careful study of the forms of stone implements, the mode of chipping and general skill they evince is as necessary for a proper classification as the bones found associated with them; the term Mesolithic appears to be stable for those objects in suitone which neither belong to the drift period nor to that of polished stone.

Then in regard to the rude specimens found on the chalk plateau by Mr. B. Harrison, &c., in recent years under conditions which clearly indicate that they are older than the usual valley drift implements; the line of demarcation is sufficiently clear to form them into a distinct group.

I venture to suggest the following four divisions of the Stone age as being more suitable in the light of recent knowledge:—

1. Eolithic; Roughly hewn pebbles and nodules and naturally broken stones, showing work with thick ochreous patina, found on the plateaux of the chalk and other districts in beds unconnected with the present valley drainage.
2. Palæolithic; Implements from the higher river drift of the present valleys and such as from their form are of the same age, but are found in the oldest breccia deposit of some limestone caves—these implements are made from nodules and were generally from their form, &c., used in the hand without haft, or are coarsely made axes, &c.
3. Mesolithic; Implements which from their form, and in many cases from the character of the deposit in which they are found, appear to be of intermediate age between the Palæolithic and Neolithic, or polished stone periods. The implements are of flat pear shape or of more decided axe form—no implement with unworked butts—implements made from flakes struck off nodules taken direct from the chalk.
4. Neolithic; Implements of polished stone or delicately worked like the specimens from Danish and other tumuli.—Dolmens, &c.

I would again refer to the flint implements found associated with later geological accumulations, or in other positions which indicate a higher antiquity than that usually assigned to the Neolithic period. The implements found in valley deposits at East Dean and in other parts of Sussex or Kent, or embedded in chalk rubble, head, or old detrital accumulations, but particularly in the matter formed in many dry chalk valleys, as affording evidence of a continuity of Man's existence, connecting the episodes of human history between the later stages of the Quaternary period and that of polished stone.

The occurrence of implements of Palæolithic type, at East Dean and in other places to which allusion has been made, may be explained when taken in conjunction with those of Mesolithic form, by the suggestion that the makers of the old forms were gradually attaining a higher state of progress, and so, while retaining in part these old types, were gradually adopting forms more suited to them; or we may assume that the Palæolithic folk living in some of the valleys of the South Downs became intermixed and absorbed by tribes more advanced in art.

However we may explain it, we are met by the fact that a large number of workers in flint lived in and about the valley of East Dean, drawn there probably because the material was accessible without mining, and probably for a long period. The enormous number of chips and worked fragments of flint

scattered over the fields indicates that, whatever may be the history of the implements of drift type; a great flint industry was carried on there, and all kinds of flint implements were fabricated, and it is probable that, at any rate, in its later stages they were distributed by barter with other and, perhaps, distant tribes.

During the vast period involved in the changing fauna and in human history associated with later geological changes, there was ample time for many races or hordes of men to follow each other in succession into this country, until they were arrested by the old barrier—the sea to the westward. There are isolated remnants of old races in Europe, who were once distributed over the greater part of the continent. While many of their ancestors have been absorbed by advancing tribes, they have retained their racial characteristics, and not been fully incorporated with the various peoples which have issued from the Asiatic continent; and they have to some extent been left behind too in culture.

The Neolithic stage of industry remained in Denmark where there is no evidence of a Palæolithic period of human art, long after bronze had been introduced from the east into Southern and Central Europe, and when the bronze stage of progress did reach the western confines of Europe, the art of working that metal had reached a high state of perfection.

May not the like cause, that of geographical position, have operated at the later part of the Palæolithic period in England and the Palæolithic workers who have left us some of their old forms at East Dean, &c., have survived here, until they became absorbed, and their implements improved, by invading races who had attained a higher level of progress.

Discussion.

Prof. Rupert Jones said that the thanks of the Institute were due to Mr. Brown, for his careful and instructive compilation of what is known about flint implements and the geological proofs of their age, and for his excellent suggestions as to the probable method of hafting some of these tools or weapons. The speaker had always thought that small flakes, more or less dressed and worked, were abundant in palæolithic, as in neolithic gravels, but had been often overlooked, and that the so-called palæoliths were not made only in the earlier period, but that similar forms occurred with neoliths, because not only had the fashion here and there continued, but some were rough beginnings for further manufacture. The occurrence of different kinds of worked flints at Cissbury, and the succession of forms met with in some caves supported the view that different tribes in separate localities would sometimes keep their own fashions, occasionally improve them, and probably would be

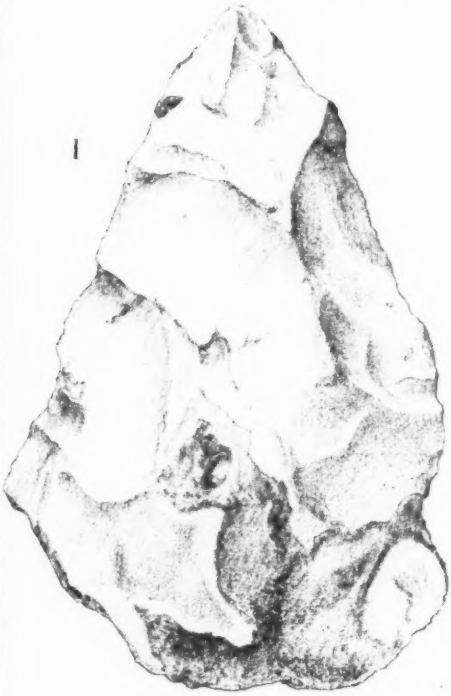
succeeded by other tribes; and the same wants, similar materials to deal with, and the exercise of the same faculties, would lead in later times to the reproduction of fashions of former periods.

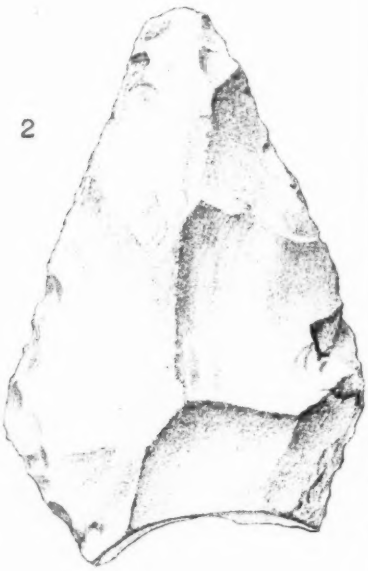
Dr. TYLOR remarked that the distinction between "Palæolithic" and "Neolithic" constituted a step of the utmost importance in the early history of man, the value of which was not lessened by the argument derived from such evidence as that of Cissbury as to the probable continuity of these two periods, in which direction Mr. Allen Brown's paper had brought together much of the most prominent evidence. He inquired as to the number of cases in which the Author was prepared to show early pointed flakes notched so as partially to develop a tang approaching neolithic forms of spear or arrow heads, as the weight of such evidence must depend on repetitions excluding accident. It would be of great interest to produce further evidence of the kind mentioned by Mr. Brown, as to marks of grinding done as if to re-edge chipped implements, and constituting a step towards the ground stone age. But neither in this way, nor as to traces of hafting, ought any but conclusive proof to be received. Dr. Tylor concluded by mentioning the Tasmanians as showing by the absence of hafting of their stone implements, that this art must by no means be taken for granted in the Palæolithic period.

The AUTHOR, in reply, said he was pleased to find from the remarks of the President and the other speakers that his deductions as to the continuity of the two stone periods in this country had not been opposed. In reference to the large flint double axes of the older and later ages exhibited, he pointed out that the one from the Thames Valley drift had three distinctly chipped depressions (two at the top and one beneath) for the reception of the withe, and that this mode of hafting (as well as the axe formed by inserting a stone in a club) was continued through Neolithic times to the present day among savage races. This was shown by a specimen now in the Ashmolean Museum, of which a sketch was exhibited. It was discovered with a withe doubly coiled around it. With regard to the spear head from East Dean, with depressions to secure it to the shaft, it was one of many similarly formed spear points which had been discovered, and was probably of transition age. Alluding to Dr. H. Woodward's remarks, the Author said he had entered in his paper somewhat fully into the gradual extinction and retreat of some of the quaternary mammalia during the period when some of the implements from East Dean, &c., were in use, because such evidence, where it could be obtained, was a reliable test of age. He then drew attention to his various exhibits, as follows:—

1. A collection of flint implements from East Dean, Sussex, &c., of Palæolithic, Mesolithic, and Neolithic types; with those of Palæolithic type are placed drift implements from

Palæolithic Series.





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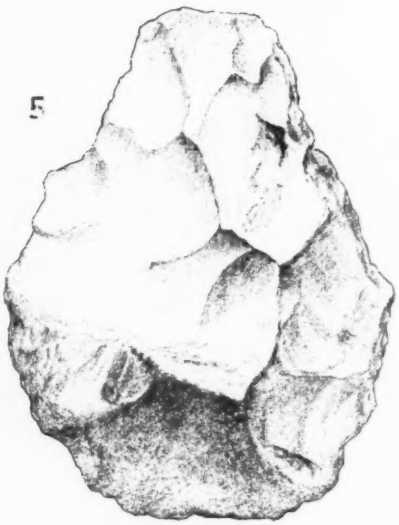
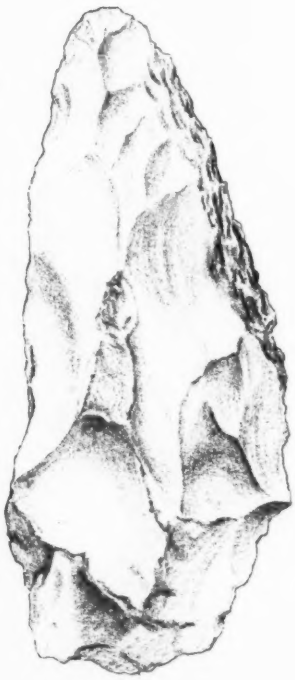
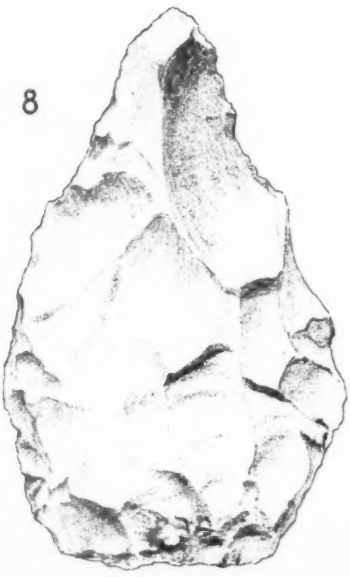
Palæolithic Series.







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the Thames Valley of the same forms, to show their continuity into the succeeding stage.

2. Flint implement of the oldest period re-chipped at a later Palæolithic time, found associated with the other implement from East Dean (Mr. Hilton's Coll.).
3. Implements showing the origin of the Neolithic "humped" form in the Palæolithic period.
4. A series of flint implements of the Eolithic period (Plateau), Palæolithic (drift in the present valleys), Mesolithic (transition), and Neolithic periods, showing the evolution of the axe-head or celt from the simply chipped pebble or nodule of the earliest epoch to the first axe blades of the Age of Metal.
5. A series of large double-edged axes from the Thames Valley drift; also a very large one from the brick earth at Iver, Middlesex (nearly nine inches long), of probably transition age with others of the Neolithic period; one drift specimen has worked depressions for the reception of the withe, also large axe implements slanting at the butt and showing the probable mode of hafting.
6. A series of Palæolithic and other flint implements showing the evolution of two forms of knife, the long flakes, straight with slanting point of later Palæolithic age, and the other curved and recurved, being evolved from the old drift nodular formed implements curved at the apex, or from simply a nodule pointed (combined weapons and tools the *coup de poing* of Mortillet), also sketch of native Australian curved knife of glass (Pitt Rivers' Museum, Oxford).
7. A series showing in like manner the continuity and development of the spear head from the earliest form, the trimmed nodule, thence to the neat spear heads formed from long flakes (some with rudimentary tangs) to the more perfect specimens of Neolithic age.

Description of the Plates.

Palæolithic Series—Plates I and II.

Fig. 1.—Flint implement with thick cumbrous butt—whitened surface—(formerly in Mr. R. Hilton's collection).

Found at or near the Surface.

Exceat, near West Dean, Sussex (Cuckmere Valley).

Fig. 2.—Flint implement with white patina. — Found at or near the Surface. — East Dean.

Fig. 3.—Small triangular flint implement with white patina. — Found at or near the Surface. — Friston, Sussex.

Fig. 4.—Flint implement of very ancient date—re-chipped in later Palæolithic times—the whole surface is deeply ochreous; the more recent work has a white patina (formerly in Mr. R. Hilton's collection). — Found at or near the Surface. — East Dean.

Fig. 5.—Flint implement with patina; rounded crust of the nodule at the butt. — Found at or near the Surface. — East Dean.

Fig. 6.—Flint implement with white patina. — Found at or near the Surface. — East Dean.

Fig. 7.—Flint implement with white patina—grey surface—(formerly in Mr. R. Hilton's collection). — Found at or near the Surface. — East Dean.

Fig. 8.—Flint implement with white patina. — Found at or near the Surface. — East Dean.

Mesolithic Series—Plates III and IV.

Fig. 1.—(Plate III.)—Large flint implement of axe form—bleached surface—(formerly in Mr. R. Hilton's collection). — Found at or near the Surface. — East Dean, Sussex.

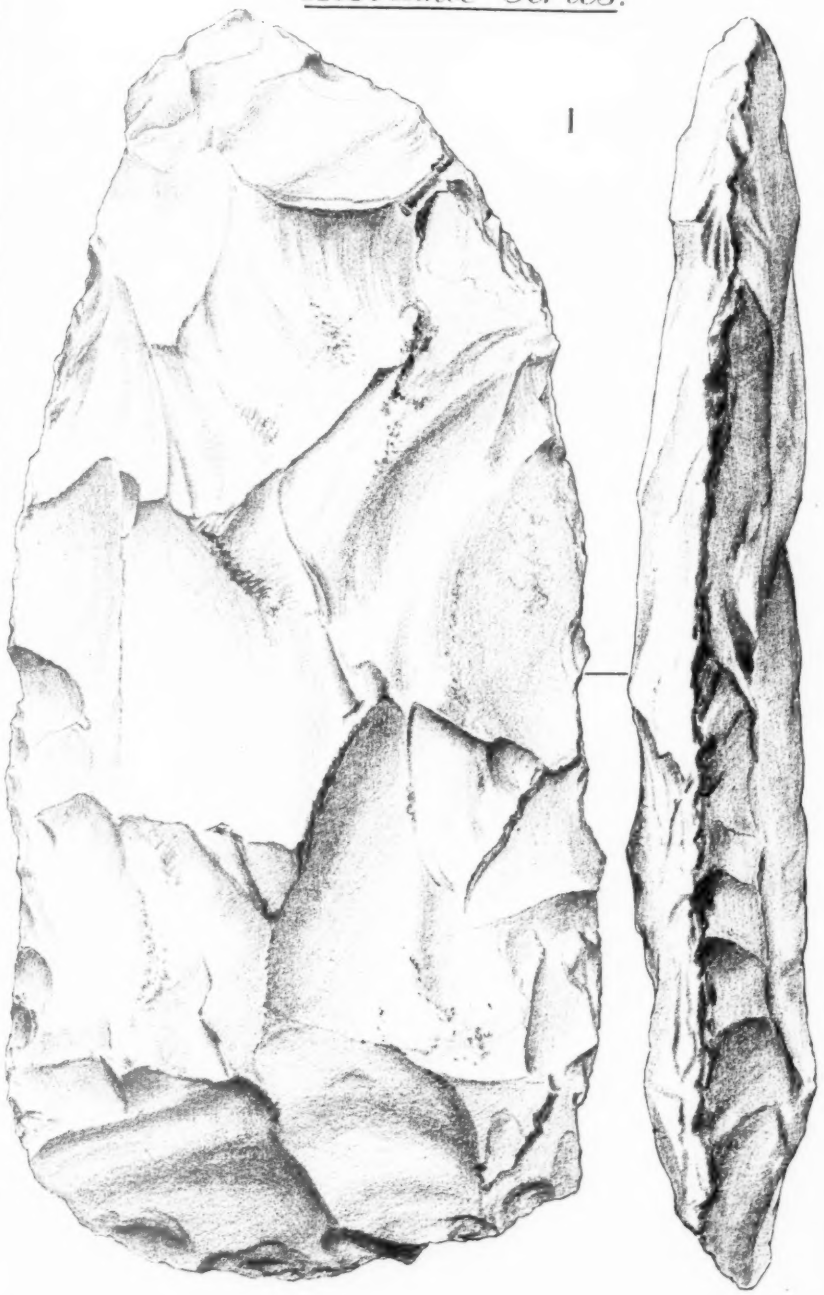
Fig. 2.—Flint spear or lance head chipped into a depression on each side of the butt—white patina. — Found near the Surface. — East Dean.

Fig. 3.—Flint double-bladed axe, very thick—white patina. — Found near the Surface. — East Dean.

Fig. 4.—Flint implement worked on both faces—bleached surface—(formerly in Mr. R. Hilton's collection). — Found at or near the Surface. — Ringwood, near East Dean.

Fig. 5.—Long pointed flint implement—white patina—(formerly in Mr. R. Hilton's collection). — Found at or near the Surface. — Exceat, near West Dean (Cuckmere Valley).

Mesolithic Series.



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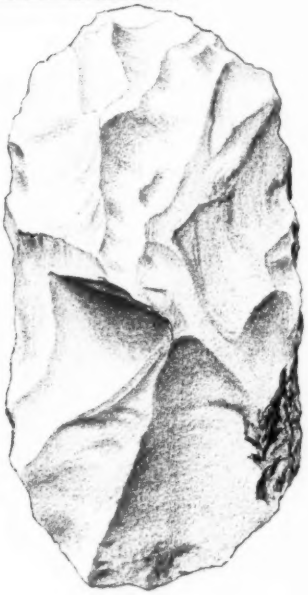
Mesolithic Series.



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EAST CENTRAL AFRICAN CUSTOMS. By JAMES MACDONALD.

THE following brief account of a few of the customs common among the tribes of East Central Africa, in the region of Lake Nyassa, have been gathered from many sources, most of them having been revised and corrected by missionaries and others who have, during the past twelve years, been resident in the Lake region. I wish especially to mention my indebtedness to Dr. Elmslie, the late Dr. Kerr Bain, and the Rev. Duff Macdonald.

As early as 1586, Don Santos, writing of the natives of Eastern Africa, inclines to the belief that they once were acquainted with true religion, and that they had degenerated to such a degree that it, and all idea of a former civilisation, had been entirely lost. This opinion he based upon the existence among them of trial by ordeal, which he regarded as having its origin in Scripture, and that from this source they must have first obtained it. The worthy Portuguese, had he lived in our day, would hardly have attributed customs, dating perhaps thousands of years before the Exodus, to the Mosaic legislation. One fact he does record which is of deep interest, if his account can be fully relied upon, and that is, that near Teté on the Zambezi, men and women were confined in regular pens like cattle, and slaughtered for food as required. These were prisoners taken in war, and who could not, there being a large number, be "used up at once."

Of all Central African customs trial by ordeal, which is universal, is that which is most revolting to an European brought for the first time into contact with savage life. When a man is accused of any crime, as theft, arson, murder, witchcraft, or the like, evidence is brought against him in the way common throughout the whole continent. This, however, is never final. The accuser's witnesses swear to anything required of them without the slightest compunction of conscience, and as the prosecutor must produce his evidence first, the defendant's witnesses are ready to swear, and do swear, the opposite of all that has been said. Trial is invariably in open court, and nothing said by the witnesses for the prosecution can be concealed from those that are to follow. There are no affidavits, thus making contradiction at once simple and safe. If rebutting evidence were allowed, the most paltry trial would be interminable. For a witness to be called a liar is, in such a case, a compliment. It proves that his evidence told, and that he, by inference, is a very clever fellow. If the same man were accused of bewitching he

would regard it as a foul libel and demand the poison bowl without an hour's delay.

To remedy the defects of trial in court, that by ordeal is adopted in all kinds of causes, both civil and criminal. As the case proceeds before the Council, the accused at intervals demands the Mwai, and this demand his friends, if they believe him innocent, persistently press. The accuser resists the demand as unnecessary, knowing that should the culprit, even if caught red-handed, recover, he will be placed in a difficult position. He will in that case have no claim to compensation for or injury, and may in turn be successfully sued for wilfully seeking to destroy another man's reputation. The belief in the absolute certainty of trial by Mwai is universal, and the beginning and end of reasoning is thus:—"If he is guilty, he dies: if he does not die, should the stolen property be found on his person, he is not guilty; another put it there, or he was bewitched."

The life of an African properly begins at puberty. Then he is no longer a child, and discards both the work and amusements of boyhood. There is no great difference between the customs in Central Africa, and those in the South as regards infancy and childhood.[1] The seclusion of the mother, purification by the magician, sacrifice to ancestral spirits, wearing of charms to ward off evil and to promote growth and strength, are all customs with which we are familiar among the better known tribes bordering on the Cape Colony. In the Lake region the rites of initiation into manhood do differ considerably, but as this is a subject which has not been very fully investigated what follows is in a measure tentative. The rite of circumcision is general, and though many observers trace this to Arab influence there seems no sufficient warrant for the assumption. Few, if any, Arab habits have been universally adopted, and why this one rather than others? At circumcision it is customary to isolate the neophytes and treat them generally as is done by Zulus and Kaffirs, the close of the ceremonies being marked by dancing, feasting, and riot. The young men have arms put into their hands and are harangued by the elders, bards, and magicians. They are now men and men's work is to be theirs. Herding, hoeing, reaping, and all domestic duties in which they assisted their mothers, they have no longer any concern with. War, hunting, and hearing causes must now occupy their thoughts, for they are to take the place of the fathers, and on them will depend the defence of the tribe and the maintaining of its honour. They must defend their chief, avenge his wrongs, wage war at his word, and

[1] The Yao, Makololo, Makuas, Machingas, Angoni, and many other tribes observe substantially the same customs at birth and during childhood.

obey his commands if that should imply death; "a man can die but once," with which philosophy they are launched into the new life of full manhood.

Young women are initiated into the mysteries,[1] as the ceremonies are called, by rites and ceremonies nearly akin to *Intongane* in the South, and are then taught, in actual fact and by experience, much that would be regarded as immoral and not to be named among western nations. The details of these ceremonies I have not been able to obtain and verify with that degree of accuracy that would justify publication, as it might tend to mislead and confuse. One thing is certain, that in the case of both young men and women, separating into pairs with persons of the opposite sex is deemed essential. If this were neglected in the case of girls after the establishment of the menstrual function they would die. There is a second ceremony when a woman is for the first time *enceinte*. Her friends gather and make preparations as for a marriage feast; her head is shaved; the matrons in attendance sing songs and give the neophyte much advice, finishing with a glorious revel at night.

Taking the people as the traveller meets with them, the first thing to be studied is village life and personal rights and liberties. From that we may conveniently advance to the study of tribal life and national institutions. When a Yao or Wanyasa leaves his home to form a new village he wishes to strengthen his position by every means at his command. This he can do in several different ways. Free men may be induced to join him and form the nucleus of the proposed settlement; he may purchase slaves and many slave wives, or, if able, make a raid and capture slaves to do the work necessary during the initial stages. When the village is recognised by the chief it becomes subject to the general laws of the territory. There is the same Council presided over by the new headman; the same intercourse between the headman and chief by special "messengers," that is to say, confidential advisers; the same system of land distribution and tenure, with the yearly tribute, as in older settlements. Petty cases are tried by the headman, graver cases are reserved for the hearing of the Council. The head of a village may, under African law, kill his slave,[2] but only a fool would do so as he would simply impoverish himself by the value of his chattel in the open market. Besides, should a man kill a slave unjustly he himself would "wither away and lose his eyesight." Domestic slaves have a quasi right to any property they may accumulate while they remain with the master under whom

[1] Wanyasa—South end Lake Nyassa ceremonies. Boys do not pass through them, but Yao, Makua, and Angoni boys do.

[2] Yao, Anyasa, Awisa, &c.

they gather it, but if sold the property remains the master's. Most Africans like to see their slaves become rich: "Are they not," say they, "our own children." When the Fingoes left the Gcalekas, whose slaves they were, to come under British rule, they brought with them numerous droves of cattle which they were allowed to possess in the land of their captivity. A slave's wives and children belong to his master and may be sold at any time. A headman who is in debt[1] sells first his slaves, then his sisters, next his mother and finally his free wives, after which he resembles the proverbial highlander; there is nothing more of which he can be stripped.

Closely connected with personal rights and liberty is the law of inheritance.[2] A man's heir is his brother, the son of his mother, failing that, his sister's son; his own children are excluded. This, as will be easily understood, is to make perfectly sure, in a land where every married woman has a lover, that the heir has the family blood in his veins. The succession to the chieftainship is based on the same principle, which is curious, considering the terrible severity with which known cases of adultery, in the case of chiefs' wives, are punished. A man succeeds to his deceased relative's wives as well as to his property and rights; they are a part of the estate. And here it may be mentioned that wives are obtained by inheritance, by purchase as slaves, by presentation, or by raiding and theft. Generally one wife only is free. An infant a few days old may be bought and betrothed, or even an unborn child, conditionally of course. In the case of infant betrothal the suitor provides her with clothes, which is the token of his pledge.

At an African village the work is done chiefly by the women[3]; they hoe the fields, sow the seed, and reap the harvest. To them, too, falls all the labour of house-building, grinding corn, brewing beer, cooking, washing, and caring for almost all the material interests of the community. The men tend the cattle, hunt, go to war and, curiously enough, do all the sewing required on their own and the women's garments. Neater tailors than Africans it would be impossible to find anywhere. By means of an awl and tendons from animals of the chase, they can sew small squares of skin together so as almost to defy an expert to find a seam without looking at the reverse side, nor are they mean artists as regards cut and fit according to African notions. Whether they would satisfy those who wear only "tailor-made gowns," is a question which the ethnologist is not called upon to solve.

[1] Notably among the Yao.
[2] Yao, Malemya's people at Zomba, Machingas, and many others.
[3] This is universal.

Travel and public undertakings.[1]—The African cannot always remain at his own village, he may be called upon to undertake a journey on his own account, or at the behest of his chief, and in either case it is necessary to take precautions to ensure success. There are places in Africa where three men cannot be sent on a journey together for fear two of them may combine and sell the third. But that by the way. When a man has determined on a journey he must consult the oracle by means of divination. The methods most commonly employed are as follows:—The magician takes a quantity of flour and lets it fall in a steady stream on a flat stone placed at the head of the traveller's bed. If it forms a perfect cone as it falls the omen is good; if not there is an end of the matter at that time and by means of the flour cone. Sacrifice must now be offered to propitiate the offended spirits. When the cone is perfect it is covered by an inverted pot and left for the night. In the morning the pot is removed and the cone examined, if it is still whole and in the exact state in which it was left when covered there is nothing farther to be done beyond presenting a thank-offering of rice, flour, or fowl, to the ancestral spirits and set out on the journey. Should there be a falling of the cone, even a small slip down its side, it is a sign not to be disregarded, and the oracle, after propitiatory sacrifice, must once more be consulted. The flour cone is now abandoned. The magician takes a pot of beer which he pours out upon the ground. If it sinks in one spot the gods are propitious, but should it run along the ground their faces are averted in anger or grief.

Another common method of divination is by means of small stones, claws, teeth, bits of snake skin, and other odds and ends which the magician keeps in a calabash or gourd, and which are shaken to be thrown as is done with dice. He examines the position in which the contents fall, and as claws, teeth, or stones are to right or left he gives his responses, always with Delphic ambiguity. It is not necessary to have a magician present in order to consult the oracle, though this is desirable. The recognised diviners sell bits of prepared root which travellers carry. These, three in number, are in cases of difficulty placed upon the ground, two side by side, and the third across those lying parallel. The owner, after placing them in position, retires, and after an interval of some hours returns to examine them and learn the response. If they are in the position in which he left them the oracle is favourable; if not, the reverse.

But even after the responses have been favourable and the sacrifices and offerings made, the departure of the travellers may

[1] The tribes referred to are those occupying the shores of Lake Nyassa, the hills to the south, and the uplands towards the lakes to the north, but not the Angoni and hill men to the west.

be delayed. Should the leader, during the first day's march, hurt his toe against root or stump they must return and begin the process of divination *de novo*. A rabbit crossing the road they are following denotes the death of the leader should they persist in the enterprise. A certain species of snake found on the path bodes evil to the whole party. When fairly on the road they must observe certain time-honoured customs. They must not use salt; if they did, and their wives were not behaving in their absence, the salt would act as a corrosive poison of the most virulent kind. Few Africans would take this risk.

The magician is in requisition in connection with every detail of life. In a case of illness an offering of flour is made to the ancestors. This is placed by the patient's pillow,[1] where the spirits come to regale themselves with its essence. If there is no improvement the magician is called, who may simply direct the patient to change his residence for a time and then take his departure. At other times he practises the art of cupping by means of an inverted horn, in which case he professes to "extract" the disease, as is done in the South, in form of bug or beetle. Counter irritation by means of incisions, into which ashes and pounded roots are well rubbed, is termed "killing" the disease. A charm may be given which the patient must wear as a means of cure and as a talisman against evil.

By far the most common method of cure is "smelling out" the person bewitching the patient by means of sorcery, and this is done both in cases of protracted illness and when a person dies suddenly.[2] The magician may simply "mark" the person who is causing the disease, who at once goes with a present to the sick man and a fee to the magician. It is, however, much more common to find the wizard put to death as a *sacrifice*,[3] and in this the custom differs from that observed in the South. There the culprit is always put to death as a *criminal*, and only after a tribal council has met and heard him "named" in the most formal manner. In Central Africa the magician has the power of summary condemnation, when execution may follow immediately. The custom of human sacrifice accounts for the difference where, on the whole, the customs are the same, and regulated by the same usages. Anyone may be accused of bewitching, and in the case of sudden death a traveller as readily as a resident. Dr. Elmslie, while travelling among the Angoni a year or two ago, came to a village where he halted for the night. He had three days of forest travel before he could reach the next settlement. The morning of his intended departure

[1] Yao as observed by Rev. Duff Macdonald.
[2] Angoni, Notes by Dr. Elmslie.
[3] Rev. Duff Macdonald, Nyassa Region.

threatened rain, and his men, as always happens in such circumstances, were determined not to move. Again and again he tried to get them together, but without success. When he was about to give the case up as hopeless, a wailing and howling was set up in one of the houses and taken up by the villagers in chorus. His men came flying to their loads, which they picked up and struck into the path adjuring him by all the gods they knew to follow instanter, as someone had died and they might be accused of bewitching. The doctor followed, nothing loth to get on the road so easily.

The magician, when answering questions, shakes his gourd and examines the claws, teeth, and pebbles it contains.[1] From these he receives his oracles, and according to their position his answers are satisfactory or the reverse, but generally shrewd advice if somewhat ambiguous. It is they who prepare war medicine and doctor soldiers for the field; they, too, prepare the poison bowl and administer it to those who are to be tried by that means. At births, deaths, and marriages they are in constant attendance, and while the chief derives his revenue largely from voluntary gifts, the magicians receive fees which are rigidly exacted.

An institution peculiar to Central Africa is the prophetess,[2] who combines with her prophetic functions the office of witch detective. As she is the most terrible character met with in village life, a detailed account of her office and method of procedure may be interesting. It is to the prophetess the gods or ancestral spirits make known their will. This they do by direct appearance and in dreams or visions. The prophetess, who is frequently the chief's free wife, dreams her dreams and then gives forth oracles at intervals, according to the exigencies of the case. These are generally delivered in a kind of hysterical frenzy. When she sees the gods face to face, which always happens at the dead hour of night, she begins by raving and screaming. This she continues till the whole village is astir and she herself utterly prostrated by her exertions. She then throws herself on the ground and remains in a state of catalepsy for some time, while the villagers gather round her, awe-stricken, waiting for her revelations. At last she speaks, and her words are accepted without question as the oracles of God. Has she not seen the ancestors face to face? Has she not heard their voice sending a message to their children? Is she not their friend, to whom they have shown favour? Must not all hear the words of those who have gone before?

After these revelations the prophetess may impose impossible

[1] Auyasa, Yao, Mauganga, Wanasomba, &c.
[2] Walolo tribe and Lake Shirwa district generally.

tasks on men, and they will be attempted without question. She may order human sacrifices, and no one will deny her victims. Suppose she, for any reason, declares that a person must be offered in sacrifice to a mountain deity, for there are gods of the valleys and gods of the hills, deities of the rivers and of the forests, the victim is conducted to a spot indicated by her and bound hand and foot to a tree. If during the first night he is killed by beasts of prey, the gods have accepted the sacrifice and feast "on his fat," which is "as the smell of spices in their nostrils." Should the victim not be devoured, he is left to die of starvation or is thrown into lake or river with a sinker attached. "The slave was not worthy of the god's acceptance. He is worth nothing to anyone." Fowls and other animals killed in sacrifice are not burned; they are simply left near the "prayer tree," and when devoured during the night the sacrifice is accepted. Among the tribes farther south, animals sacrificed are cooked and eaten with the exception of the sacred portions, which are burned with fire.

As a detective of wizards and witches, the prophetess is in constant demand. When travelling on official duty in this capacity, she goes accompanied by a strong guard, and when she orders a meeting of a clan or tribe, attendance is compulsory on pain of confessed guilt. When all are assembled, our friend, who is clad with a scanty loin-cloth of leopard skin, and literally covered from head to foot with rattles and fantasies, rushes about among the crowd. She shouts, and rants, and raves in the most frantic manner, after which, assuming a calm, judicial aspect, she goes from one to another touching each person's hand. As she touches the hand of the bewitcher she starts back with a loud shriek and yells, "This is he, the murderer, blood is in his hand." I am not certain if the accused has a right to demand the Mwai, but it appears this may be allowed. My impression is that the law does not require it, and that the prophetess' verdict is absolute and final. The condemned man is put to death, witchcraft being a capital crime in all parts of Africa. But the accuser is not content with simply discovering the culprit. She proves his guilt. This she does by "smelling out"—finding—the "horns" he used in the prosecution of the unlawful art. These are generally the horns of a small species of antelope and which are *par excellence* "witch's horns." The prophetess "smells out" the horns by going along the bank of a stream carrying a water vessel and an ordinary hoe. At intervals she lifts water from the stream which she pours upon the ground and then stoops to listen. She hears subterranean voices directing her to the wizard's hiding place, at which, when she arrives, she begins to dig with

her hoe, muttering incantations the while, and there she finds the horns deposited near the stream to poison the water drunk by the person to be bewitched. As they are dug from the ground, should anyone, not a magician, touch them, even accidentally, the result would be instant death.

Now how does the detective find the horns? By what devil's art does she hit upon the spot where they are concealed? The explanation is very simple. Wherever she is employed she must spend a night in the village before commencing operations. She does not retire to rest like the other villagers, but wanders about the live-long night listening to spirit voices. If she sees a poor wight outside his house after the usual hour for retiring, she brings that up against him next day as evidence of guilty intention, and that, either on his own account, or on account of his friend the wizard, he meant to steal away to dig up the horns. The dread of such dire consequences keeps the villagers within doors, leaving the sorceress the whole night to arrange for the tableau of the following day.

In addition to the horns, arms and pieces of human flesh may be dug up in suspicious places, and this is the carrion on which witches and wizards feed. Any one tasting a morsel of such food is himself thereby converted into a wizard. Witches and wizards have midnight feasts, so says the legend, at which they gorge themselves with human carrion. Hence it is that in many parts the dead are not buried till putrefaction sets in, and graves are watched a considerable period after interment. The detective may not be known as such to a wizard, and may pretend to follow the same art in order to gain his confidence. If then the wizard offers the detective human carrion no farther proof of guilt is needed. Whether such food is ever offered to these rogues it is difficult to say, as their word is accepted without question or enquiry.

Witches can cause milk to flow down through a straw from the roof of a house,[1] and by this means rob their neighbours of the milk of their goats and cows. When I read of this superstition for the first time it reminded me of an incident, connected with a similar Celtic superstition, which happened in Sutherlandshire about twelve years ago. In that region a superstition still lingers that witches can "steal the feet" of cows by walking through the fields while the dew is on the grass, dragging a rope made of cow hair after them. A Thurso mason well acquainted with north country superstitions, was employed in the district at the time referred to, and got a quantity of new milk daily from a crofter's wife. At the beginning of August she sent to say she could no longer let him have new milk, as that went to the

[1] This is pretty general in East Central and South Africa.

shooting lodge, but he could have milk from which the cream had been taken. The wily rogue sent her the following message: "Tell your mother I do not wish to be nasty, but I must have new milk, if not by fair means, then otherwise. I shall take it from the rafters of the house rather than want." Next morning the girl appeared with skimmed milk, thin and blue. Malcolm had meantime made his preparations. He had bored one of the roof couples and fixed a bladder filled with milk in the thatch so as to empty its contents through the hole when required. He then carefully plugged the hole. When he saw the quality of the milk sent, he asked the girl into the house that she might see what happened there. He next took an augur and bored the plug away, when down came a stream of rich milk and cream. After that he had but to ask what he required. No one dared refuse his most extravagant demands. His reputation as a wizard spread far and near over the country side, and still lingers there among the superstitious.

Wizards visit their victims while asleep, and "instil" a powerful poison, known only to themselves, into the ear.[1] For this there is no cure; the patient withers away, and dies "when all the flesh has melted off the bones." They bewitch fowls, cattle, crops, everything a man possesses. They make his wives barren and himself incapable of begetting children. They put enmity between him and his friends, In one word, there is no evil but they practise, and a great deal of the legislation of the country is designed to put down this crime, and punish those who are found guilty of it.

Murder and Serious Crimes.—Though witchcraft is the most serious crime in the eye of an African jurist of which a man can be guilty, there are other crimes which are regarded as capital offences. Of these murder, arson, adultery among women of the higher or ruling caste, and overt acts leading to war, are the most common. When a murderer is caught and proved guilty he is given over to the relatives of the person murdered,[2] who have power to dispose of him as they choose. It is contrary to custom to sell a murderer, as this would be equivalent to accepting payment for the relative lost, so he is put to death either by summary execution or by the slower process of torture according to the fancy of the deceased's family. It is customary also, among Yao and Wayisa, by way of propitiation to give up a slave or some relative of the criminal's to "go along with the one who was slain," and this seems to be invariably done when one is killed by accident, in which case the slayer may escape, the deputy taking as it were

[1] Manganga, Angoni, Yao, Walolo.
[2] Nyassa region; also Tanganyika and among Bantu tribes generally.

his place. It is also customary in the case of a man murdered to bury one of his own slaves along with him, so that "he may not go alone." Among some Nyassa tribes the executioner is ceremonially unclean, and must bathe in running water.

Arson is a rare crime in Africa, and in the case of destruction of crop by bush fire kindled recklessly, the *lex talionis* seems to be applied universally in a rough and ready way. Field for field, fowl for fowl, with the loss of personal liberty where there is nothing to take. Slavery makes the Central African a much more sombre individual than the free men of the South. It adds an element of danger and uncertainty to human life, as that is lived in the African village, which colours every institution, and adds a new terror to every form of obligation.

Theft, as it is the most common, is one of the most serious crimes in Africa. A thief taken in the act may be killed with impunity. He is a wolf, and wolves are made to be destroyed. Thieves have charms by which they can send a man into such a sound slumber that they can enter his house with impunity and steal his goods. When one is formally accused of theft he has the right of public trial, but evidence is never regarded as conclusive. The magician, who here as on all public occasions, is master of ceremonies, may put a stick into his hand[1] and according as the stick moves towards his house or away from it he is guilty or innocent, this is but an older form of table turning. The accused may, if the evidence is overwhelming, plead guilty, or he may demand the Mwai. If guilty he trusts to his demand being resisted by the prosecutor; if innocent he believes that he will, without fail, vomit the poison. Theft of stock is always a capital crime,[2] and the victim is put to death by flogging, or a limb, as a hand at the wrist, is cut off, and he is then placed in the stocks and left to bleed to death. At times the bleeding stops and in that case he is simply left to die of starvation and the fatigue of sitting in a strained position.

In a land where chastity is almost unknown, and where, among many tribes, a premium is placed on young women who have proved themselves capable of child-bearing,[3] the law regarding the relations of husband and wife is a curious medley. A marriage may be dissolved through either spouse speaking disrespectfully of the other's relations.[4] The death of a wife's children is sufficient cause why she should be divorced, but she can retaliate and divorce her husband if he neglects to sew and mend her garments. If they are not pleased the one with the

[1] "Yao and dependent tribes," Rev. Duff Macdonald.
[2] Lake Nyassa, Shirwa, Zomba.
[3] Tribes occupying regions south of Zambezi towards Swaziland.
[4] Wayisa, and others south end of Lake Nyassa.

other, and this is mutual, what we would call incompatibility of temper, the courts will dissolve the marriage tie. Though a husband is not in common law responsible for a free wife's debts, it is no uncommon thing, after a separation, for him to present her with a male slave and *vice versâ*.

When we turn from these trifling causes of separation to offences as adultery, we seem to enter another continent.[1] The wife who may be discarded if she neglects her hoeing, is hacked to pieces if caught in an intrigue, and the husband who is divorced if his wife can show a neglected rend in her petticoat, is promptly executed if found making love to a wife his neighbour has already determined to be rid of because some of her children have died of an attack of measles. One chief puts all male offenders to death on the ground that they might one day interfere with his own too numerous spouses, another has one of the offender's members cut off, cooked, and served for his dinner, which he is compelled to eat. After this he is, as often as not, put to death. A man who seduces a betrothed girl is treated in the same manner as if he carried on an intrigue with a married woman. Ordinary offences against morals among unmarried persons are regarded as venial and hardly to be visited with censure in some tribes, while among others their young women are closely guarded. A guilty wife may be forgiven by her husband, but in this case he cannot live with the faithless one till a third party has been with her.[2] This man's name is concealed from the husband, as he would always be jealous of him and might on small provocation kill him. If a guilty woman were to put salt in her husband's food, and he were to eat it, he would surely die, hence it is that many women have a habit of always asking a little girl to put in the salt. This is a wise precaution ; any one may be caught halting and it might be awkward if a wife in the habit of salting her husband's porridge were to have, on occasion, to ask another to do it. Questions not easily answered might be asked.

When any man is accused of crime, or a Yao woman of adultery, the law admits examination by torture ; in the latter case a stone is placed in a jar of boiling water, or even oil, and the suspected wife is ordered to fish it out with her arm bared. According to the injury inflicted her guilt or innocence is determined. If on examination of the scalded limb she is found guilty she must confess the name of her lover. Should she still persist in protesting her innocence a kind of skull-cracker is applied to extort a confession. This is composed of a long piece of wood partially split. Her head is inserted into

[1] Yao, Wemyisa, Makololo, Wemyanga, and generally lake regions.
[2] Tribes round Blantyre, south end Lake Nyassa.

the cleft and the free ends drawn towards each other by means of ropes. While this process goes on the chief sits, calmly smoking a pipe, and now and then suggesting a name to the poor tormented victim. She knows that any one mentioned by her will be put to death without farther trial, and it frequently happens that, with the fortitude of despair, she remains silent until the walls of the skull collapse and another life is quenched in darkness.

War.—In South Africa war resolves itself into a cattle hunt; in the Lake region of East Central Africa it is largely a slave hunt. A dangerous neighbour or rival can be effectually curbed by carrying away a large number of his subjects and sending them to market. This resolves war largely into raiding by means of a sudden and unexpected descent. The elaborate preparation of the South would warn the whole country, and while the doctor was engaged "charming" the army and distributing magic tokens to render the braves invulnerable, the enemy would have put "seven hills" between himself and the advance column. All the same, there is a close resemblance between the war usages of the South and what we find in Central Africa. There we find, especially among the Angoni, the Basuto habit of cutting out an enemy's heart and liver and eating them on the spot. We also find the habit of mutilation for the purpose of reducing the parts to ashes to be stirred into a broth or gruel, which must be "lapped" up with the hand and thrown into the mouth, but not eaten as ordinary food is taken, to give the soldiers courage, perseverance, fortitude, strategy, patience and wisdom. Should a brave leader retire to a mountain and die there unconquered, his spirit becomes, according to Yao tradition, the guardian of the rain clouds that gather there, and to him offerings and prayers are presented at the great national gatherings for rain. Mantanga inhabits Mangohi, the mountain the Yao remember as their home, and to him they pray and sacrifice for rain. He is liberal to his children and bestows great plenty. Chitowe on the other hand is surly and is associated with drought, famine, and leanness. He sometimes appears as an emaciated child or a young woman. These, and many others, are the spirits of warriors who perished centuries before the white man came to bring a new and terrible implement of destruction, and to introduce strange customs and stranger gods to people whose ways have been uniform since before the Flood.

Death, mourning, and worship.—Death is largely caused by wizards. The very introduction of death into the world has a suspicious look of witchcraft about it; in any case it was caused by a woman who taught two men to go to sleep. One day

while they slumbered she, more cruel than Jael, held the nostrils of one till his breath ceased and he died.[1] So it happens that "death and sleep are one word." When a man dies, if his death was caused by witchcraft, there is no safety for any one till the suspected person drinks the poison bowl. How such are discovered has been already indicated; the poor wretch who must drink the poison may be the man's most intimate friend, his nearest relative or perhaps his wife. There are even occasions when a large quantity of Mwai is prepared and numbers take it together. In this case wizards and witches are "cleaned out" wholesale. The practice is not uncommon on the Shire and the Zambezi.

Apart from the discovery of the culprit the dead are mourned for by a persistent beating of drums by night and by day,[2] and also by a continued howling kept up by relatives, and others of whom many may be hired for the occasion. The louder the drumming, the greater the grief. Relatives shave their heads, and in the case of a chief this is done by all his tribesmen. At the grave offerings are made, and the same is continued for a varying period at the votive pot placed on the site of the deceased's house.

At times, in the case of persons of social importance, as generals in the army and councillors, mourning is prolonged for many days before sepulture takes place, and in that case the body is encased in bark and placed in a suitable position, with a hole dug in the floor underneath to receive the decomposed and putrefied matter which exudes from it. The body is ultimately buried in the house, which is razed and the materials carried away that the spot may be levelled and a votive pot placed there. A slave is frequently killed and put in the same grave with his deceased master, that the latter may not have "to go alone." Enemies killed in war are not buried.

When sepulture is to take place in the usual place, and according to the general custom of the country, the body is wrapped in a mat, usually the person's bed, and a curious custom observed by Yao and Wayisa, who perform this office, is washing their hands as a ceremonial act. This is quite distinct from the idea of uncleanness after handling a dead body, and which requires bathing in running water before eating or associating with their fellow men. After the ceremonial act of washing is performed, the body is carried to the grave suspended along its length to a bamboo pole. When the grave is

[1] Yao tradition, told also by Wayisa.

[2] Macdonald, "Description of Funeral and Mourning Customs in Nyassa Regions." Mock funerals are most common among the Angoni.

dug it is carefully lined with palisades and green branches. At either end a forked stick is driven securely into the ground at the bottom of the grave, and the body suspended to the bamboo pole is placed in position, the ends of the bamboo resting on the forked sticks and preventing its touching the ground. A canopy of boughs is then placed over it to prevent the earth falling down on the body, and the grave is filled in as is usual. A slave may be killed to accompany the deceased, but not necessarily. The house occupied by him is burned and a votive pot placed on its site. Similar pots are also placed on the grave. When the chief of a tribe dies he is buried in his house, which is not taken down nor burned, and in this case the votive pot is placed outside the door under the verandah. The personal articles of the deceased, pipes, broken spear, walking sticks, ornaments, badges of office, charms, and wallet are placed in the grave, and this seems to be common among all, or almost all, African tribes. When mourning for the dead is concluded, which is after a varying period, there is feasting, drinking, revelry, and a second shaving, after which the dead is forgotten, or at all events seldom or never mentioned except as an ancestor to be worshipped, and then not by name but by relation, "my father," "my brother," "my chief," "my chief's son," &c.

A man worships the spirits of his own ancestors; a village, those of its departed heads; a tribe, those of its chiefs. The names of great warriors are kept long in remembrance, and we meet with many such whose history, exploits, and country are quite lost, but whose memory tradition preserves as great spirits who are high in rank above ordinary ancestral gods, and on whose will depends the destiny of peoples and the conditions of life as regards plenty or scarcity. This is common to almost all Bantu tribes. Worship takes the form of prayer, offering, and sacrifice. Reference has been made to the manner of human sacrifice, and its frequency among certain tribes is appalling. When the gods are offended, men must die; when hungry, cattle or fowls serve their turn; and when only to be propitiated, as in view of a favour desired, flour or corn is acceptable to them. At great national gatherings, as for rain, the magician, in the priestly character, conducts the sacrifice and the prayers, as also in cases of disaster and national mourning. In connection with rain-making the chief supplicates his own special god or guardian ancestor. A dance is held in his honour, and the chief throws up water to indicate that he prostrates himself and his people at the spirit's feet, who has the giving or withholding of that for which they pant and die. At times *Mpambe*—light-

ning—in the form of a deity of the clouds, is invoked for rain by Yao and Shirwa tribes, but *Mulunga*, the great spirit, or more properly great ancestor, is the deity to whom men look for help in times of distress and drought. This worship of Mulunga leads to a kind of tribal pantheism in the Lake region, for, after all, is not the Earth the mother of us all, Mulunga himself included. In the more private devotions of the people of the Nyassa region Mulunga does not appear, but a man may not only pray and sacrifice to his own ancestors, but also to the old inhabitants who occupied the country before his forefathers took possession of it. The people are gone, all dead, but their spirits live and dwell in the old place and see all that goes on in which they take an interest. There do not seem to be family and tribal distinctions as such among spirits; in any case they do not fight about territory as men do. No Milton has yet appeared in Central Africa to set the spirits by the ears.

The dead, however, may reappear in the form of animals, but only for pure mischief.[1] Widows are often held in bondage and terror by their lords returning in the guise of a serpent. This brute will enter the house, hide in the thatch, and look at its victim from between the rafters. It will coil itself by the fire and steal into the beds; it will glide over articles of food and explore the interior of cooking utensils. For this persistent persecution there is but one remedy, and that is to kill the serpent, when there is nothing left but "pure spirit," which cannot appear in material form any more.

A Yao spirit appearing in material form is different from a spirit's messenger, which also appears in animal guise. The latter may be a bird, a form which a spirit cannot assume, but which can be sent as a messenger to make known the spirit's will, somewhat after the manner of those sacred chickens which the stout old Roman threw over the side when they refused to eat. The African, too, can deal somewhat summarily with bird messages when his interests and inclination lie in that way, but this implies a degree of courage which is phenomenal.

Among the Angoni and the people dwelling on the western side of Lake Nyassa there is a common belief that demons hover about the dying and dead before burial, to snatch away their souls to join their own evil order. By the beating of drums and firing of guns such evil spirits are driven away, but a more certain method of avoiding their machinations is to have a mock funeral and so mislead and confound them. When it is determined to have such a funeral, an artificial body is manufactured

[1] Angoni, Manganga, Waomba, Anyasa, &c.

of any convenient substance, and treated exactly as is done with the bodies of the dead. This lay figure is carried a considerable distance to a grave, followed by a great crowd weeping and wailing as if their hearts would break. Drums are beaten, guns fired, and every species of noise made. Meantime the real corpse is interred near the dwelling as quietly and stealthily as possible. The evil spirits are effectually deceived; when the mourners retire there is nothing in the mock grave but a bundle of rushes, while the true grave they do not know and cannot find. Traces of this still linger in the South.

Man's origin.—As the African must account for the origin of death so, too, he has a theory regarding the first appearance of man on the earth. Both he and all other animals came out of a hole in the ground, after which Mulunga—the great ancestor—closed up the opening. The place is now desert, no man dwells there, and the spot is known to none. The gods refuse to reveal it. Whether this is that it may not be opened, and other creatures be allowed to escape from it, their philosophy does not very clearly explain, but what is very certain is, that monkeys were men at the time of their exit from the earth,[1] but having quarrelled with their friends went to "dwell in the bush." To vex and harass those whom they left they began to pick the seed from the ground after it was sown, and this habit having grown to be hereditary monkeys cannot grow corn, as they "could not leave their own seed in the ground," which is perhaps as good a definition of the difference between men and monkeys as any given by scientists.

Reference to monkeys reminds one of that wonderful procession seen by the Pasha, where each carried a torch to light him in his depredations among the corn-fields, a story which one man explains by referring it to Emin's defective eyesight, another to a possibility of monkeys being able to produce fire by friction. Without giving any opinion regarding the accuracy of the observer, a statement made to me by a South African native, a Pondonusi, may throw as much light upon it as all our science. At the time I paid little attention to it, and, indeed, it passed quite from my mind till I came across the Pasha's story in Mr. Stanley's book. It was, so far as I can recollect, in the following words—the connection in which it was told is of no importance—"The master is surprised. There are monkeys in the mountains," the gorges of the Drakensberg, "that go to the fires men leave in the bush and carry away burning sticks; they even go up the trees with them and then throw them down. I have not seen it myself, but I have heard say that when women leave

[1] This tradition Mr. Macdonald found common in the Shirwa and Nyassa regions.

a fire near the edge of the bush they come out to the grass openly —with burning pieces of wood and play with them, some say they carry them back to the fire to make them burn better." If this is a true and sober version of what is not uncommon, a little less science and a little more ordinary intercourse might have saved the eminent if erratic German a good deal of idle speculation. One can quite fancy monkeys playing with fire-brands found near the edge of the forest, carrying them off in their march to the corn fields, to cast them aside when the work of depredation began.

If man's origin can be satisfactorily accounted for, his destiny is shrouded in impenetrable gloom. All spirits live, nor can they be killed, but how employed or what country they inhabit is known to no one. It is true a man's ancestors watch over his life, and the chief's ancestors guard the honour of the tribe, but beyond this all is uncertainty and doubt.[1] A man's spirit is not at his grave though it may be met there, it is not at his old home, but still it sees the offerings placed in the votive pot. It does not inhabit his son's house though he cannot cut his nails or trim his hair without his father's eye being upon him, and should he fail to bury the clippings of his nails or to burn the produce of the barber's shears he may expect to be reminded of it in the most unpleasant manner; nor is it a man's own actions alone that come under the cognisance and censorship of his father's ghost; should his wife, while he is on a journey, anoint herself with the oil or fat in daily use, she will not only suffer herself but bring calamity upon her husband; should she dream during his absence she must offer a private gift for herself and the absent one. So far the wishes of spirits are known, but how they employ themselves in the spirit land, and what are the mutual relations between them has never been told. A chief remains such in virtue of his office, but as to the relations between rival chiefs and old enemies "the people who are here do not know; it never was known, for they never told."

In a paper which appeared in vol. xx, No. 2, I gave an account of the Kaffirs' theory of the origin of death. The same tradition, in a modified form, the Rev. D. Macdonald heard among the Yao in the Nyassa highlands, and records it as follows:—The chameleon was sent to the graves to say, "When people die they may return to their homes." He went off and was passing along the road. Afterwards the salamander was called to go to the graves and say, "When people die they must not return." The salamander ran and arrived quickly while the chameleon was still on the way, and said, "When people die they must

[1] The following customs are gleaned from notes and references by missionaries in the Nyassa and Tanganyika Lake regions; no particular tribes being named. The customs seem common.

not return." Next morning the chameleon appeared. He said, "When people die they may return." Those at the graves said, "No, the salamander came and he told us the truth." Then the chameleon went back to report at the village, and said, "The salamander was first, he gave the order, 'When people die they must not return.'" Those at the village said, "How silly. You were stupid, O chameleon, you should have made haste."

A comparison of this legend with the one referred to will show that the former is much more elaborate and has the appearance of being general rather than local, as there is no reference to "village" or "persons," but rather to spirits or powers, under the figure of "the never-dying Sudiwa," whatever that may be.

The same people account for the origin of the sun in this way:—Two men went out hunting and took shelter in a cave from a storm of rain. While in the cave one found a place where there was heat, and they began to search, and move the stones where the heat was felt. After they had made an opening they peered in and saw the sun. One exclaimed, "Look! look! come, let us run away." This he did, but the other continued to remove the stones, when the sun burst out and burned him that he died. As it left the cave it set the grass on fire and then rose up on high, where it has ever since remained.[1] The moon, on the other hand, was a fire which a great man kept in a pot. This his children were not allowed to touch. One day while he worked in his garden he slept, and remained there over night. The children opened the pot where there was light and brightness. The fire flew away and lighted on a hill-top. They climbed to get it down, but it flew up to the clouds and was lost for ever. It has since given light to all men. Stars are stones with which M'kwilima's children played and flew up to become fixed on high. The first star was a stone that hit and killed a child while at play. Wind was originated by a great man blowing to cool a favourite daughter who complained of the heat. Mwangalika made a fire and caused its smoke to become clouds to shade his people.

Turning from speculations regarding creation, life, and death, to the daily concerns of this world we meet with a number of very curious minor customs and institutions among the Yao and allied tribes. One of these is that of surety, or what we might call Godparent. Every girl has a surety, and when her hand is sought in marriage it is this official who is approached and not her parents. He makes the necessary arrangements and sees what provision is to be made for her and her children should she have any, and also, in the event of her being sent

[1] Yao myths and legends.

away without just cause, how she is to be supported and cared for. When a free wife, for this institution applies only to free women, is dismissed she returns to her surety, and he redresses her wrongs and makes such adjustments as the circumstances admit of.

In the ordinary conduct of affairs, domestic and public, women have no voice; everything is regulated by the men, who may be said to sit perpetually in council. A Yao woman asked if the child she is carrying is a boy or girl, frequently replies, "My child is of the sex that does not speak." The position of woman is practically that of a chattel. Women kneel when addressing men, and go off the public path into the grass or bush when they meet any of the opposite sex as a sign of subordination and subjection. Young girls do not take milk; if they did it would make them barren. Women, especially Makololo, wear a lip ring the size of a small table napkin ring in the lip, not suspended as earrings are, but inserted into the lip as the "eyes" through which "reef points" pass are inserted between the canvas of the sail and its "bolt-rope." It causes the lip to project an inch and a half in front of its natural position and at right angles to the teeth and gums. A small brass or lead ornament is suspended from the side of the nose, which is pierced for the purpose, as the lobe of the ear is for earrings. Some of the front teeth are knocked out as a beauty mark, and the arms, cheeks, breast, and shoulders are tattooed with strange and fantastic devices. Necklets of teeth, shells, or bits of wood are common, and brass wire is in great demand for bracelets and anklets. The dress consists of a loin cloth of skin, cotton, or bark. The latter is made by stripping a piece of bark from a tree and then beating it with an ebony hammer till soft and pliant. It is easily torn, and even when treated with the greatest care does not last long. On the Shire and round Lake Nyassa the people have hardly any stock except fowls and a few goats, and are thus precluded from having the comfortable sheep-skin garments so common among the Kaffirs. Domestic animals are precious in Central Africa, so when chickens are hatched the abandoned egg shells are collected and hung up in the house to protect the brood from hawks and accidents of all kinds.

Industries and art.—The principal industries among the tribes whose customs I am considering consist of pottery and working in iron.[1] They manufacture clay pots of beautiful design and burn them with considerable skill. There is a tradition linger-

[1] The Angoni own a tribe of inner Africa which they have reduced to the position of domestic slaves. They are the best smiths in the Lake region. Whence they came I do not know, but they were not natives of that region originally.

ing in odd corners that once upon a time their ancestors used hollow stones as pots before the art of pottery was discovered. If this is true, of which there is no adequate proof, however, it effectually disposes of Don Santos' idea that the East Central African had gradually degenerated from a higher civilisation, and points rather to a record of progress. And there seems to be beyond question steady if slow progress in their skill in working metal and fashioning implements of war and husbandry. There is no question that within a comparatively recent period they tilled the ground with wooden implements, for the memory of it lives in universal tradition among them. At no very remote date a Tubal-Cain appeared, and since his day the iron-headed hoe has found its way into the remotest hamlet, and the national ingenuity has found exercise in fashioning and ornamenting weapons of war. The improvements made in the manufacture of implements of husbandry and tools for the craftsman are insignificant compared with the advance in the manufacture of spear and battle-axe. The iron they smelt from its native ore by a primitive process of blast furnace, and then work and temper it much as was done by our country smiths two or three hundred years ago. I have seen spears of African manufacture, made by Baralong smiths, tempered so finely that it required a good Sheffield blade to turn their edge. This is, however, exceptional, and the vast majority of articles made are soft and the iron coarse in texture when broken. In woodwork their progress has been slower, and beyond polishing spear handles and the manufacture of musical instruments, pillows—a regular article of commerce—pipes, walking sticks, and mallets, not much is done; the manufacture of canoes, their greatest triumph, being always excepted.

The social usages among the people are complicated, and an accurate account of the details of domestic life is much more difficult to obtain than of village and tribal life. Reference has been made to the subordinate position of woman. Should a free Yao or Wakonda wife steal, her surety is responsible, and for the act she may be dismissed from her husband. A mistake in etiquette towards the chief is severely punished, and among the Waganda the offender may be slain on the spot. A man will hardly address another directly as "you," nor will he use a direct negative if he can avoid it, The expressions are "The master knows," etc., and for a negative, "I will see if that happens." Untruthfulness is a national characteristic, but sympathy, tenderness, and fidelity are not wanting and are at times strongly marked. In critical or dangerous circumstances a joke may restore good humour as if by magic.

Of minor superstitions the number is legion. Children wear

a charm round the waist; stakes are driven into the ground on the edge of the corn fields and bound with herbs to protect the crops. Anyone touching these will die on the spot. When mourning in the Nyassa region they hold capsicum to their nostrils to induce tears, and drink a particular medicine when on a predatory expedition. Some animals are sacred; others unclean. A few are worshipped or preserved because of their utility or some superstition regarding them. The common black and white crow occupies a peculiar position in this respect. Crows eat and destroy the growing crops, especially corn, but for this they have a valid excuse; it is this:—Once long ago a Yao chief was greatly perplexed and in sore straits. A crow came and gave him such information and advice as he required. The chief gave the crow a very large present of grain of which it dropped and lost many seeds on the way home. These seeds the crows are still looking for, and in their search pick up others in the fields. Poor crows!

The general conduct of village life in Central Africa bears a close resemblance to what we are so familiar with in the South, though this is greatly modified by the existence of slavery on the one hand, and the almost total absence of horned cattle in the Lake region. A pastoral people regulate their whole life with a view to the care and increase of their stock. Hunters or mere tillers of the ground, by a regard to the existence of animals of the chase and the fertility of the soil on the margin of swamps or along the banks of rivers. This again tells on domestic institutions, law courts, councils, parliaments, and the office of chief, hereditary or otherwise. For example—A man flies from an enemy, or because of a prosecution for witchcraft, and takes up his abode high up a mountain side. There he gathers round him a few friends and retainers, who either at his death or when the feud is ended descend to the plain and take up their abode with the tribal community. In after years the story of the flight and cave dwelling is told with such additions and embellishments as suggest themselves to the narrator, and so it happens that the descendants of the mountain men come to regard the original fugitive as an ancestral chief, more rarely a man god. His spirit is their guardian spirit; the mountain is his home. It is a holy place to be had in reverence, and the rain-cloud which gathers on its summit is the home of the lightning god. So do legends grow, and so, too, do families rise to importance and office among their fellow countrymen.

When the descendant of such a fugitive, or the son of an hereditary chief, but especially the former, is invested with office as chief of a tribe, he swears fealty by his ancestors.

He is then harangued by the councillors who were near his father's person, and next by what we may term the jurists of the tribe. He is himself regarded as in a sense divine. The first duty laid upon him is hospitality. The wayfarer with sore feet and fainting from fatigue must never be turned away from his door. His hand must not be always closed. When men high in rank visit him they are not to go home "with nothing that can be seen, like men returning from a desert." The next obligation laid upon him is "that he must not beat his own people too much," which literally means that he must not be too exacting in the matter of "presents" to replenish an exhausted exchequer. How he is to reconcile the duty of unlimited hospitality and the perpetual drain upon him in the matter of "what can be seen," with stringent economy and nominal taxation never enters an African's head. Both are virtues. The chief must practise all the virtues, and that is an end of the whole matter. When he has promised to practise all the virtues demanded of him, his temples are begirt with a garland, as among Yao, Wayasi, &c., and this, or a more simple substitute, he wears as his badge of office. When the garland is placed on his head, his father's high priest, or chief magician calls him by his official name, and the coronation is complete. This official name must not be the same as his father's and is generally a new name of his own choice, as is the case with the Lords of Session in Scotland. The chief's first official act is to appoint a chief magician or high priest, who is to be confidential Minister of State. The other officers who acted under his father may retain their places, but not necessarily.

The details of domestic life I have not been able to gather with any degree of accuracy, but it would be of interest to know the ceremonies at birth, when the Wayisa or Shirwa mother retires to the bush with two or three friends before the birth of the child, to return when it is about three days old; at marriages when the bridegroom goes to his wife's home rather than she to his; at dances and in connection with the ceremonies of initiation; at feasts of first fruits and when the seed is sown, but these are details which do not seem to have been observed with great accuracy, and indeed it is difficult to do so, for I can testify that one may live for years among Africans and remain ignorant of customs and ceremonial usages practised by his own servants and attendants. Any one who shows special curiosity regarding the details of life is never told the truth. There seems in that case to be a conspiracy to mislead or tell him only what is deemed good for him. I have heard, and written down, what was heartily laughed at by my half civilised attendants who were familiar with all the native customs. I

have seen elaborate ceremonies performed solely for the purpose of misleading me and baffling my curiosity. I once found a famous wizard in a neighbour's cattle fold "doctoring" for some plague which had broken out among the cattle. I asked if he was so-and so. He answered, "No." I was not satisfied and took up his wallet which lay on the ground. He made no objection. I emptied it and examined its contents, and still he chatted pleasantly, though he knew that my handling his charms meant his returning to his home, a distance of forty miles, in order to "cleanse" his properties before he could complete his work. I was quite thrown off my guard and left, supposing him to be an ordinary traveller. I afterwards discovered that it was the man I thought, and whom I had long wished to meet. He successfully avoided my questioning, and often baffled my curiosity afterwards.

Only by comparing the statements of many persons or by actual observation, making sure a tableau is not arranged for one's special benefit, can one be certain that he is not imposed upon. Unfortunately many write down whatever they are told, and only revise it when there is no possibility of testing its accuracy. Like the cockney, who, in passing through the Sound of Mull, asked the late Dr. John MacLeod, of Morven, "What food do the *natives* on either side live upon?" and receiving the reply, "Potatoes and cuddies," transferred it to his journal, thence to reappear in an English newspaper in this form:—That "the inhabitants in parts of Argyleshire live principally on potatoes and donkey," utterly unconscious that the "cuddie" is a well-known local fish!

MARCH 22ND, 1892.

FRANCIS GALTON, Esq., F.R.S., *Vice-President, in the Chair.*

The Minutes of the last meeting were read and signed.

The election of Dr. A. B. MEYER, Director of the Royal Ethnological Museum, Dresden, as an Honorary Member, and of FREDERICK TAYLOR, Esq., of New York, as an Ordinary Member was announced.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From the AUTHOR.—The Peabody Museum of American Archaeology and Ethnology. By F. W. Putnam. 8vo. pp. 12.
—— Della comparazione dei caratteri fisici dei delinquenti e dei non delinquenti. By Dott. Raffaello Zampa. 8vo. 1890. pp. 19.
—— Crania Italica vetera. By Dott. Raffaello Zampa. 4to. 1891. pp. 79.
—— Sulla Etnografia dell'Italia. By Dott. Raffaello Zampa. 4to. 1891. pp. 10.
—— Breve nota di Etnografia Comparata. By Dott. Raffaello Zampa. 4to. 1891. pp. 4.
—— Contribuzione alla Etnografia della Melanesia. By Dott Raffaello Zampa. 4to. 1890. pp. 16.
—— On the Modification of Organisms. By David Syme. 8vo. London, n.d. pp. viii, 164.
From the PUBLISHERS.—Text-book of Psychology. By William James. 8vo. (Macmillan and Co.) London, 1892. pp. xiv, 480.
—— Illegitimacy. By Albert Leffingwell, M.D. 8vo. (Swan Sonnenschein and Co.) London, 1892. pp. viii, 160. Maps and Diagrams.
—— The Naturalist in La Plata. By W. H. Hudson. 8vo. (Chapman and Hall.) London, 1892. pp. viii, 388. Illustrations.
From the DEPARTMENT OF MINES, NEW SOUTH WALES.—Memoirs of the Geological Survey. Palæontology. No. 8.
From the ÉCOLE D'ANTHROPOLOGIE DE PARIS.—Revue Mensuelle. 1892. No. 3.
From the EAST INDIA ASSOCIATION.—Journal. Vol. xxiv. No. 1.
From the EDITOR.—Nature. Nos. 1167, 1168.
—— Revue Scientifique. Tom. xlix. Nos. 11, 12.
—— Nouvelle Iconographie de la Salpêtrière. 1892. No. 1.
From the ROYAL ARCHÆOLOGICAL INSTITUTE.—The Archæological Journal. No. 192.
From the ROYAL UNITED SERVICE INSTITUTION.—Journal. No. 169.
From the ANTHROPOLOGICAL SOCIETY OF WASHINGTON.—The American Anthropologist. Vol. v. No. 1.
From the FOLK-LORE SOCIETY.—Folk-Lore. Vol. iii. No. 1.
From the ROYAL AGRICULTURAL AND COMMERCIAL SOCIETY OF BRITISH GUIANA.—Timehri. Vol. v. No. 2.
From the ROYAL SOCIETY.—Proceedings. No. 305.
From the SOCIETY OF ARTS.—Journal. Nos. 2051, 2052.

Mr. FRANCIS GALTON laid upon the table a register of physical measurements of schoolboys made at frequent intervals by Dr. Almond, the Head master of Loretto School, Musselburgh.

Mr. GALTON said: An interesting register of physical measurements of schoolboys, taken at frequent intervals, is laid on the table. It was made by Dr. Almond, the head-master of Loretto School, Musselburgh, who is a staunch advocate of physical education as reacting on the moral and intellectual character. The register is of anthropological interest in many ways, upon which it is not my object now to dwell. I submit it to the Institute only for the purpose of placing the existence of the document on record, and of drawing attention to the zeal of its compiler.

Mr. J. THEODORE BENT read a paper on "The Archæology of the Zimbabwe Ruins."

Mr. FRANCIS GALTON, Dr. J. EVANS, Mr. C. H. READ, Mr. A. L. LEWIS, Miss A. W. BUCKLAND, and Prof. W. H. FLOWER took part in the discussion, and the Author replied.

On the FINDS *at the* GREAT ZIMBABWE RUINS (*with a view to Elucidating the* ORIGIN *of the* RACE *that* BUILT THEM).

By J. THEODORE BENT.

[WITH PLATES V TO IX].

I PROPOSE this evening to discuss seriatim the finds that we made during our excavations at the Great Zimbabwe ruins, presupposing a knowledge of the construction of the buildings themselves, which can be gathered from an inspection of the model and the plans. I also propose to give my own opinion on the things in question arrived at after a careful consideration of the objects taken collectively, with a view to inviting discussion on a subject which is shrouded with such a veil of mystery.

Firstly, let us take the birds perched on long soapstone pedestals, which decorated the outer wall of the semicircular temple on the hill; these birds are all conventional in design, and, though different in execution, would appear to have all been intended to represent the same bird; from the only one in which the beak is preserved to us intact, we undoubtedly recognise that they must have represented hawks or vultures, the thick neck and legs, the long talons, and the nature of the plumage point more distinctly to the vulture. The decorations on some of them, namely the chevron pattern round the wings, the necklace with a brooch in front and continued down the back, the raised rosette shaped eyes point to a high degree of conventionality evolved out of some sacred symbolism, of which these birds are

the embodiment, and the nature of this symbolism is what we now wish to arrive at.

Two of the birds, similar in character and slightly varying from the others, are represented as perched on zones or cesti; two others have only an indication of the cestus beneath their feet; a fifth has two circles carved under it, and two on the wings, a sixth is perched on a chevron pattern, hence there is a similar class of symbolism connecting them all.

My opinion, based on comparison with the other objects found, is that these birds represent the Assyrian Astarte or Venus, namely the female element in creation. Of the maternal aspect of the vulture we have ample evidence from an Egyptian source. Horapollo tells us (i., ii.) that it was emblematic of "Urania, a year a mother," whilst Ælian goes so far as to suppose that all vultures were females to account for their character as emblems of maternity. The cesti and the circles point obviously to this. In Lucian's description of a temple at Hierapolis, near the Euphrates, in his work *De Syriâ deâ*, we have much that is in accord with these temples at Zimbabwe, the double walls, the sacred enclosure, the peculiar nature and structure of the tower; and, finally, in § 33 p. 479, he mentions a curious pediment, of no distinctive shape, called by the Assyrians "the symbol," on the top of which is perched a bird. Amongst some of Schliemann's discoveries at Mycenæ there are also images surmounted by birds, which differ from the *ξόανον* in the *De Syriâ deâ*, solely in the fact that they are not shapeless but represent a nude female figure.

In the difficult question of early Arabian cult, which was closely bound up with that of Egypt, Assyria, and Phœnicia, we find the vulture as the totem of a Southern Arabian tribe, and worshipped as the God Nasr, and on inscriptions mysteriously alluded to as "the vulture of the East, and the vulture of the West." The religious symbolism of these birds is further attested by the two smaller representations of the larger emblems which we found, and which were evidently used as amulets or votive offerings in the temple, they too represent birds perched on the top of tiny pedestals.

In the centre of the temple stood an altar, into the stones of which were inserted, and also scattered around a large number of soapstone objects, representing in different forms and shapes the male organ of generation, the tower in short which stood in the temple below, the nature of which we will not discuss. One is naturally anxious to reject as suspicious any reference to phallic worship, unless there is ample proof to substantiate it; in this case, however, the facts are too obvious to admit of denial.

Firstly, there are the two solid round towers in the sacred enclosure of the building below, both of which we tested and found to be solid; they are carefully shut in, and approached by labyrinthine passages, the symmetry of design, and the careful execution in drystone building of the larger one, which stands 34 ft. in height, with a girth of 53 ft., is marvellous, and the evenness of the courses is wonderfully carried out. The towers are placed in an angle of the wall, as it were, and coincident with the sacred enclosure on the outer wall of the temple runs the chevron pattern, and this portion of the wall is alone decorated with large standing monoliths. Before the tower is a raised platform presumably for sacrifice, and the wall facing inwards, is the only one decorated with courses of black slate. Similarly, in the little ruin near the Lundi River, an indication of a round tower is roughly given in the middle of the pattern by a semi-circular bulge in the wall.

With considerable difficulty, by the aid of a monkey rope which hung near, we were able to get to the top of the tallest round tower; the summit, when perfect, would probably admit of two men standing on the top, and a few courses below the summit ran a pattern formed by the stones being placed edgeways (which from a comparison with the finds of a kindred nature I take to indicate the line of circumcision).

Again turning to Lucian's *De Syriâ deâ*, the description of the Phalli towers in that temple corresponds almost exactly to ours. He describes the edifice as surrounded by two walls, with two large towers, 30 cubits in height, of solid structure, and when a priest had to ascend he had to put a rope round himself and the Phallus tower to walk up.

Montfaucon in his *L'Antiquité Expliquée* also gives us additional testimony to this tower worship. He says: "The ancients assure us that all the Arabians worshipped a tower, which they called El Acara or Alquetila, which was built by their patriarch Ishmael.

Also in the Bible we have frequent allusions to this tower worship, notably in Judges viii, 17, where Gideon is described as destroying the sacred town of the Midianites, called Penuel, or "the Face of God."

The Arabian historian, El Masoudi, also speaks of the old tower worship of the Arabians, describing them as eight cubits in height, placed in an angle of the temple which had no roof on; and, in another place, he asserts that most of these temples were round.

Phœnician temple structure also illustrates that tower worship. The coin of Byblos, with the temple and the Phallus (sacred cone) set up within the temple precincts is an excellent parallel;

also the sacred cones in the round temples of the Cabiri, in Malta, point to the same form of worship.

In the temple on the hill, with the birds decorating its outer wall, we found many soapstone objects of small size, miniature representations of the tower below.

Around the altar we found 38 of them, unmistakable phalli, most of them had the line of circumcision marked and the protruding gland; one represents the organ with testicles and seminal cord. One is a highly ornate object with a winged sun or perchance the winged Egyptian vulture on it, showing either Assyrian or Egyptian influence, and a rosette forming the summit; others again are badly executed, but the fact of finding them all in close juxtaposition around the altar, is sufficient proof of the nature of the objects and their religious symbolism.

Thus we have in both cases the larger emblems and their miniature representations, the tower and the smaller phallic objects, the large birds and the tiny amulets, proving to us that the ancient inhabitants of Zimbabwe worshipped a combination of the two deities, which represented the creative powers of mankind.

A curious confirmation of this is found in the pages of Herodotus, who tells us—

"The Arabians of all the gods only worshipped Dionysus, whom they called Ourotalt and Urania," that is to say, they worshipped the two deities, which, in the mind of the father of history, represented in themselves all that was indicative of the mysteries of creation, pointing to the very earliest period of Arabian cult, prior to the more refined religious development of the Sabæo Himyaritic dynasty, when Star and Sun worship superseded the grosser forms of nature worship. Lucian, in his description of the above-mentioned temple, adds on page 477 the temple contains a shrine, on the shrine are images of a god and goddess, the goddess wears a cestus, "with which none but Urania are adorned."

The large outer wall of the fortress was decorated with small round towers alternating with monoliths of rough, unhewn granite, some 10 to 12 feet in height. This brings us to another marked phase in the study of the mysteries of the Zimbabwe ruins, namely, the great attention paid to stones decorated and undecorated, in connection with their religion. We have already seen how monoliths decorated the outer wall of the sacred enclosure in the circular building where the towers stood; besides these in the same building are three large monoliths erected in the ground. At the summit of the fortress was a little platform also decorated lavishly with the same. Palgrave in his travels in Lower Nejd speaks of the

many monoliths he saw—"huge stones, like enormous boulders, placed endways perpendicularly on the soil . . . they were arranged in a curve, once forming part, it would appear, of a large circle . . . that the object of these strange constructions was in some measure religious seems to me hardly doubtful . . . in fact, there is little difference between the stone-wonder of Kaseem and that of Somersetshire."

El Masoudi also alludes to the stone worship of Arabia, probably this gross fetichism formed at one time a part of the national religion of the Semitic nation.

Maxime, of Tyre, says they honoured as a great god a great cut stone; Euthymius Zygabenus further tells us that apparently "this stone was the head of Aphrodite, which the Ishmaelites formerly worshipped, and it is called Bakka Ismak;" also he adds, "they have certain stone statues erected in the centre of their houses, round which they danced till they fell from giddiness, but when the Saracens were converted to Christianity, they were obliged to anathematize this stone, which formerly they worshipped."

One of these stones which stood originally on the platform was of soapstone, 11 feet 6 inches long, and decorated with geometric patterns around it, divided into compartments by circular bands, each of a different pattern; this stone we have brought home with us, together with all the birds. Besides this we found three other fragments of similarly decorated soapstone beams, which all apparently came from the same spot; also here we found several stones of a curious nature and entirely foreign to the place and its formation. One, a blackish kind of slate, which had formed a beam with naturally bevelled edges, a fragment of basalt, and three stones with lines round them, formed by a species of asbestos eaten away, and a tiny one with curious lines around it; all pointing to the fact that the ancient inhabitants of these ruins, whenever they found a curious formed stone, brought it here and put it on the platform, where they kept all their revered stones—a spot which would compare well with the *βαιτυλια* or Bethel of the Phœnicians, closely akin to the Southern Arabians.

The next series of finds, namely, the fragments of soapstone bowls, brings us to consider more closely the artistic capacities of this race. The work displayed in executing these bowls, the careful rounding of the edges, the careful execution of the circle, the fine pointed tool marks, and the subjects depicted thereon, point to the work of a race considerately advanced in artistic skill.

Unfortunately of the three bowls, which would have been most instrumental in assisting our researches, we could only

find three small fragments. One of these is a fragment of a soapstone bowl which evidently had a religious procession round it, of this we have only a hand holding a pot containing incense or some other offering in it, and an arm of another figure with a portion of the back of the head with the hair drawn up in folds, but this alone is sufficient to prove the foreign element of the builders of the ruins, and that they came from more northern climes, as is also evidenced by the fact that for the town and fortress they chose the southern or shady side of the hill, whereas the Kaffirs always prefer the sunny side, and on cold days we could not even get them so much as to work in the ruins.

The second of the three fragments has on it an elaborate design taken from the vegetable world, from some plant with a spathe and an ear closely akin to an ear of corn; this is admirably executed in soapstone and a brighter green than that employed in the other articles.

The third fragment is the lip of a large bowl which must have been over two feet in diameter and around which apparently an inscription ran, the lettering is painfully and provokingly fragmentary, and no one has as yet attempted to read it. At the same time, one cannot help seeing a likeness in these letters to certain characters on a rock, discovered and drawn by Mr. A. A. Anderson, somewhere in Bechuanaland, and also to certain of the rougher Himyaritic inscriptions found in Arabia. This is of course too speculative a point to go upon, but at the same time, I give it for what it is worth. In Charles Huber's travels in Arabia several inscriptions are given which offer a marked resemblance to the lines on our bowl.

The most elaborate of the bowls has a hunting scene around the side very well worked, and comparing well with some of the work executed during the Sabæo Himyaritic period in Southern Arabia. The details are carefully brought out, the breath of the animals is depicted, the lines of the zebras, and the bird is also well done; but the man who is hunting is more like a baboon than a human being.

Another bowl has a procession of bulls round it, depicted with very long horns; and of the three pairs of horns our fragments show us, all are placed differently. Another fragment gives us the remains of three zebras; and another bowl has a carefully executed cord pattern round it, whilst the last of our fragments worth mention has a chevron pattern round it, alternating with what appears to be a representation of the round tower. Besides these there are many fragments of perfectly plain bowls, notably a large one, 2 feet 6 inches in diameter, with the edges carefully rounded, a very fine piece of

workmanship, the whole of which we were able to recover, except a portion of the bottom of it.

From the minor finds very little definite can be inferred, except the world-wide commerce which was attracted here, and that this commerce was carried on by the Arabians; there were near the surface a few fragments of Celadon pottery from China, of Persian ware, and an undoubted specimen of Arabian glass and beads of doubtful provenance, though one of them may be considered as Egyptian of the Ptolemaic period. It is impossible that a collection of things such as there could be brought together here by any but a highly commercial race like the Arabians were, or their kinsmen of Phœnicia.

Some of the fragments of pottery we found at Zimbabwe are very good, especially those of one pot, which had around it a well-executed geometric pattern, which experts consider to have been worked with a tool, and if this was the case the regularity of the execution points to a highly developed artistic skill. Then again, there are fragments of pottery lids and other ceramic evidence pointing to an advanced state of society.

The finds which touch perhaps on the most interesting topic of all, are those which refer to the manufacture of gold. Close underneath the temple stood a gold-smelting furnace, made of very hard cement of powdered granite, with a chimney of the same material, and very neatly bevelled edges, portions of which I brought home with me.

Hard by, in a chasm between two boulders, lay all the rejected quartz casings from which the gold-bearing quartz had been extracted, by exposing them to heat prior to the crushing, proving beyond a doubt that these ruins, though not immediately on a gold reef, formed the capital of a gold-producing people, who had chosen this hill fortress with its granite boulders, owing to its peculiar advantages for strategic purposes; and the recent discoveries of gold reef near Zimbabwe form interesting evidence to the same effect.

Near the furnace we found many little crucibles of a composition of clay, which had been used for smelting the gold, and in nearly all of them exist small specks of gold adhering to the glaze formed by the heat of the process. There are tools also amongst our finds for extracting gold burnishers, crushers, &c., and an ingot mould of soapstone of a curious form, which is still in use amongst the natives much further north for ingots of iron. Mr. Rudler has kindly drawn my attention to an ingot of tin found in Falmouth Harbour, and now in Truro Museum, which is exactly the same state as this soapstone ingot mould of ours would produce. Sir Henry James in his pamphlet thereon draws attention to Diodorus' statement that the ancient

Britons made ingots of tin *ἀστραγάλων ῥυθμοὺς* of the shape of astragali or knuckle bone, and Professor Owen recognises this to be a form for which the term astragalus might easily be used as a simile.

An interesting parallel to the ancient gold workings in Mashonaland is to be found by studying the accounts of the ancient gold workings of the Egyptian gold mines in Wadi Allaga. The ancient Egyptians also extracted gold from quartz by means of crushing and washing, as we see from the process depicted in the paintings on the Egyptian tombs; and in any gold-producing quarter of Mashonaland, near old shafts and by the side of streams innumerable, crushing stones are still to be seen, used anciently for a like purpose. In several places there are long rows of these crushing stones, sixty or seventy in a row, which would seem to indicate that the slaves employed in this labour worked in rows chained together.

Diodorus tells us of the gangs of slaves employed in this arduous labour by the ancient Egyptians, and of the long dark shafts into which they descended. In the Mazzoe district we entered several of these ancient shafts, and it is obvious here, that not only for working the mines, but for the construction of the massive buildings, similar gangs of slaves were employed. After describing the process of crushing and washing, Diodorus concludes: "They then put it into earthen crucibles, well closed with clay, and leave it in a furnace for five successive days and nights, after which it is suffered to cool. The crucibles are then opened, and nothing is found in them but the pure gold, a little diminished in quantity."

Here we have an exact parallel to our clay crucibles of Zimbabwe.

Furthermore the gold workers of Zimbabwe were acquainted, like the ancient gold workers of Egypt, with the art of plating. This is evidenced by the spear head we there found, with a very heavy plating of gold thereon; also plating is observed on two other small fragments of iron; and an instrument found in close proximity to the furnace has obviously been used in beating gold.

I did not think much of the iron implements we found at Zimbabwe at the time, knowing the skill of the modern Kaffirs in working iron, and the avidity with which they collect all iron fragments to re-smelt in their furnaces.

However, we brought everything home with us, thinking that possibly some of the specimens might belong to an earlier period. The spear heads are obviously of the same pattern as the gilt one, which is distinctly of ancient date, having the ogee fluting still in vogue amongst the Kaffir tribes; then there are

bells like those found now thousands of miles away on the Congo, which possibly may have been an ancient pattern which the Kaffirs on the Congo with their conservative tendencies have still retained. There is work too in iron quite above the capabilities of modern Kaffirs, and tools, chisels, and adze, and spades, all pointing to a higher state of civilisation.

I will not discuss our finds now at greater length, but sum up one or two points which appear obvious.

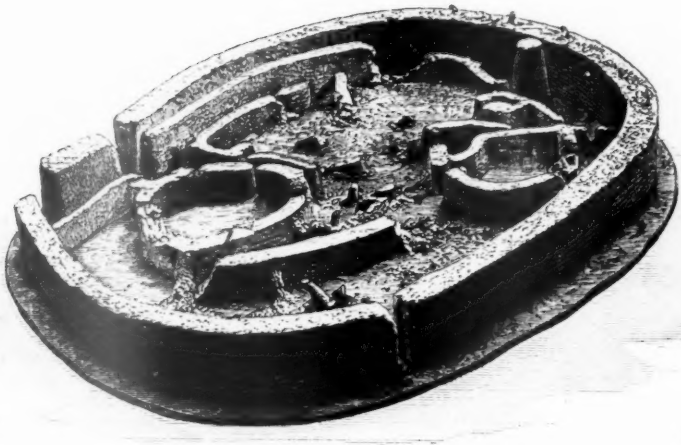
Firstly, the ruins and the things in them are not in any way connected with any known African race; the objects of art and of special cult are foreign altogether to the country where the only recognised form of religion is, and has been since the days when the early Portuguese explorers penetrated into it, and the Arabian historian, El Masoudi, wrote, namely in the tenth century A.D., that of ancestor worship; and from that time to the present day, the testimony of this historian proves to us that little or no alteration has taken place in the nature of the people. The cult, too, is distinctly pertaining to a pre-Mahommedan period, which is perhaps the furthest back that we can go with any degree of certainty, though the presumptive evidence is to the fact that the ruins date back to a much earlier period.

The second point is also obvious, that the ruins formed a garrison for the protection of a gold-producing race in remote antiquity. Forts of a similar structure are found all the way through the gold-producing country, and were erected to protect the mines.

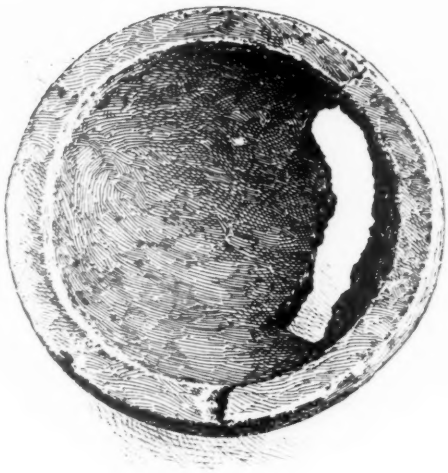
The cumulative evidence in favour of this race being one of the many tribes of Arabia is very strong. The special cult, the monolithic decorations, and the later evidence of Arabian intercourse with this country when their power was reduced only to the coast line.

Furthermore, we know that the Red Sea was bristling with activity centuries prior to our epoch; that Arab ships brought spices from India, the cassia tree from China; and the wealth of Arabia in those days was proverbial. The Bible is full of allusions to it, the monuments of Egypt bear equal testimony to the wealth of the people of Punt. Aristeas tells us "That a large quantity of spices, precious stones, and gold was brought to Rome"—*διὰ τῶν Ἀράβων* not from Arabia, but—"by the Arabian." They were in fact the carriers of the ancient world. The testimony of most travellers is to the fact that little or no gold came from Arabia; it is, therefore, not too much to suppose that a portion at least of the "Thesaurus Arabum" came from this country as well as from India.

I have not space to go into the testimony given by the German authorities on this subject. Kremer in his "Studien zur Cultur

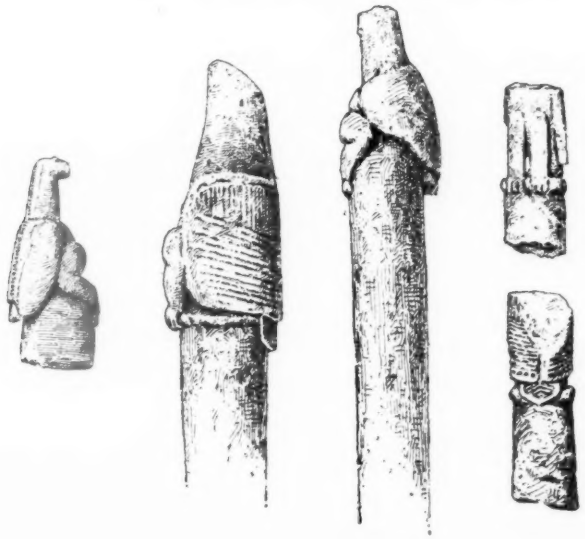


MODEL OF LARGE CIRCULAR BUILDING.



LARGE PLAIN SOAPSTONE BOWL.

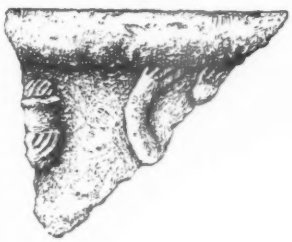
TWO BIRDS ON PEDESTALS. 5 FEET 4 INCHES HIGH.



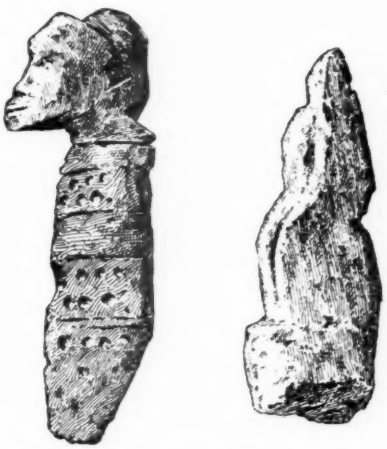
BIRDS ON PEDESTALS. ABOUT SAME HEIGHT AS ABOVE.

SOAPSTONE BOWL WITH HUNTING SCENE.

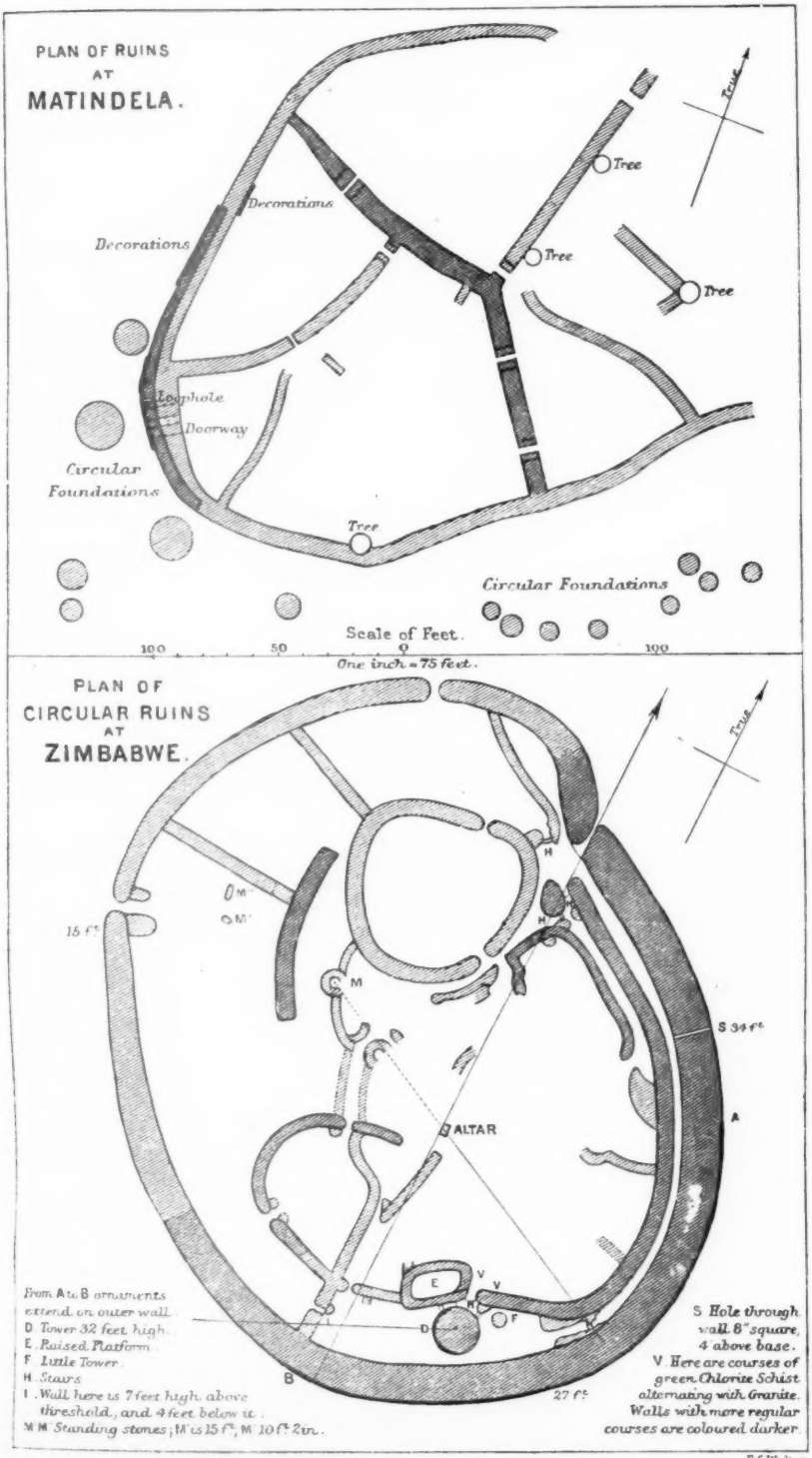
FRAGMENTS OF SOAPSTONE BOWL WITH BULLS.



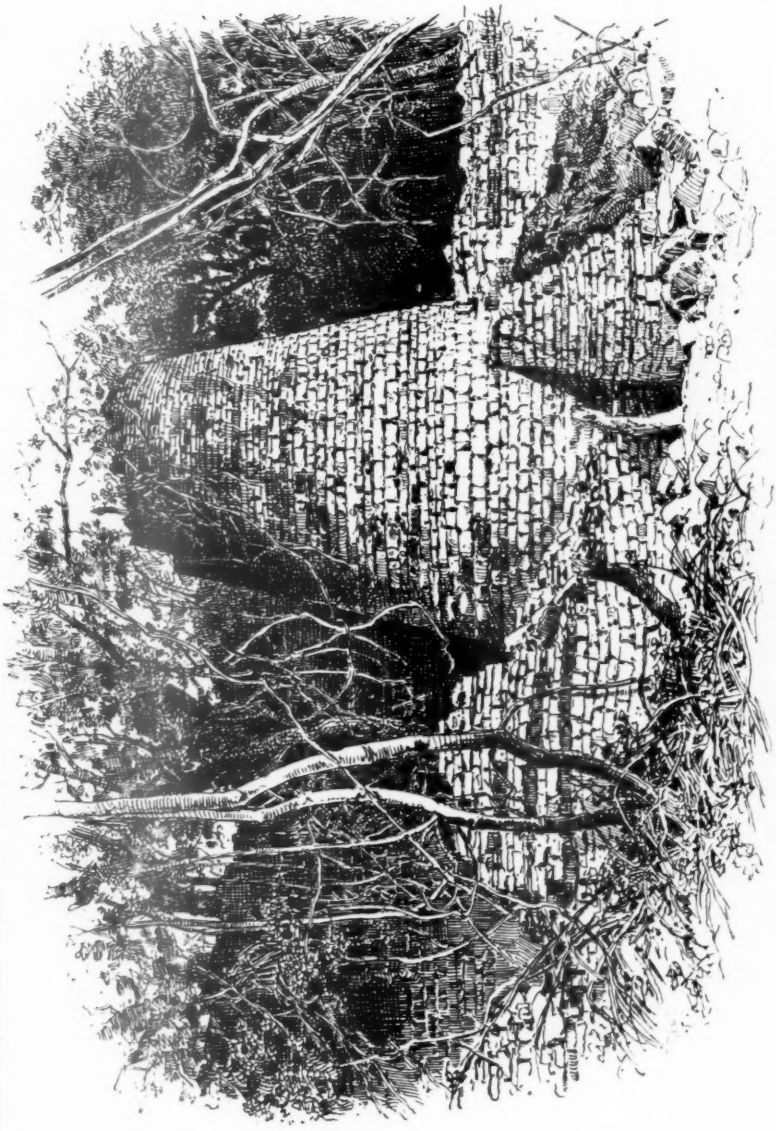
FRAGMENT OF SOAPSTONE BOWL WITH PROCESSION.



MINIATURE BIRDS ON PEDESTALS, 3½ INCHES.


PLAN OF RUINS
AT
MATINDELA.
True
Tree
Tree
Tree
Decorations
Decorations
Loophole
Doorway
Circular
Foundations
Tree
Circular Foundations
Scale of Feet.
100 50 0 100
One inch = 75 feet.
PLAN OF
CIRCULAR RUINS
AT
ZIMBABWE.
True
H
M
M
15 ft
M
S 34 ft
A
ALTAR
E
V
V
F
D
B
27 ft
From A to B ornaments extend on outer wall.
D Tower 32 feet high.
E. Raised Platform.
F Little Tower.
H. Stairs.
I. Wall here is 7 feet high above threshold, and 4 feet below it.
M M Standing stones; M is 15 ft, M 10 ft 2 in.
S Hole through wall 8" square, 4 above base.
V Here are courses of green Chlorite Schist alternating with Granite. Walls with more regular courses are coloured darker.

F S Weller.



CIRCULAR TOWER IN ROUND BUILDING, ZIMBABWE, 32 FEET HIGH.

geschichte des Arabiens," and Glaser in his travels in Arabia, go exhaustively into the question, and their evidence, all point, in the same direction and supply us with much valuable evidence in confirmation of the Arabian theory.

Our stay at Zimbabwe lasted over two months, during which time we employed native labour, superintended by a white man. The area covered by the ruins is very considerable, and all that we could do, in the space of time and with the money at our command, was to clear the ground of the vegetation which covered it, and excavate in some of the most likely places.

There is, therefore, a vast area of ground still untouched, which may in course of time yield further evidence as to the origin of the builders of these ruins, and, as the subject is archæologically of great interest in revealing the early history of mankind, I hope that ere long more work may be done in this new field for research.

(*Plates kindly lent by the Royal Geographical Society.*)

Discussion.

Mr. Galton said: We heartily, and not for the first time, welcome Mr. and Mrs. Bent to our Institute, who, with equal zeal and enterprise, have co-operated for many years in the archæological exploration of sites famous in classical history, and have now investigated the strange ruins of Zimbabwe as carefully and thoroughly as their time permitted. We must also acknowledge a debt of gratitude to the Royal Geographical Society, for it was through the help of their grant in aid, that this notable work was carried on, which has yielded results as welcome to our Institute as they were to that influential society.

Sir John Evans pointed out the difficulty that there was for any one versed only in European antiquities to form an idea as to the chronology of these African remains. The celadon porcelain might possibly have a date assigned to it, but even then its presence would only go to show that the place was occupied as a commercial centre at a certain date, and not when it was first founded and the grand stone structures erected. It seemed to him strange that as so many circumstances pointed to the place having been occupied since the days of the Ptolemies, no coins had as yet been found there. With regard to the mould for ingots of gold, he mentioned that in his own collection was an ingot of bronze of the same form as that given by the mould, but of only about half the length, which had been found with bronze tools and weapons at Makarska in Dalmatia. He expressed a hope that eventually some passage in one or other of the Arabian historians might throw light on the origin of these ruins, and finally congratulated Mr. and Mrs. Bent on the success of their expedition and on their safe return to this country.

Mr. READ said: I must confess to have been strongly of opinion, on seeing the very remarkable antiquities discovered and brought home by Mr. Bent, that their origin was rather to be sought among the ancestors of the races still inhabiting the southern part of Africa, though perhaps their present representatives might not be found in the immediate vicinity of Mashonaland. This opinion was founded upon the striking resemblance between many of the metal objects discovered, and the forms of similar tools or weapons still found among the native races of South Africa. For instance, an iron axe in Mr. Bent's collection is precisely the Bechuana axe of the present day; the double iron bell is still common among the tribes of the West, and what is still more remarkable, the spear heads with their ogee section, are reproduced constantly by the Zulus in their assegaies, as well as by tribes in Central Africa.

This opinion I have abandoned, or to speak more precisely, I have revised it, after several conversations with Mr. Bent, who has done me the honour to consult me on the matter, though I fear with little practical result. I am now rather inclined to think that though my premisses were right, the deduction was wrong. That is to say, that the resemblance between these ancient objects and the present tools and weapons does exist, but that this resemblance is rather due to these types having been introduced and impressed upon the local race by a foreign and more civilized people, though whence this gold-seeking race came, I do not feel by any means sure.

Mr. Bent has been, I think, inclined to dissociate the iron objects from those of bronze, in the belief that the former are probably of more recent date. In this I do not feel disposed to agree with him. I have carefully examined the whole of them, and to my eye they are absolutely of the same technique, material apart. To cite one instance, the bronze spear head, apparently gold plated, which has some distinct peculiarities of detail, is in all respects identical with another specimen made of iron.

The fragments of celadon porcelain found among the ruins are, without doubt, of Chinese manufacture, and call to mind the large quantity of this ware discovered by Sir John Kirk, along the coast south of Zanzibar. It is very probable that these fragments from Zimbabwe formed part of the same trade as those found by Sir John Kirk, for the Chinese ware of this kind is of such strength and durability that age makes but little change in it. Unfortunately, however, it serves no good purpose in fixing an early date in the present case; seeing that the first mention of it in Western history is the 13th century. The fragment of Arab glass discovered is of very small size, but it has evidently been decorated with gilding, and I should assign it to the 14th, or at the earliest the 13th century.

I should like, before sitting down, to express my admiration of the unusual openmindedness with which Mr. Bent has approached this very obscure subject. I found him quite ready to pursue the faintest clue, and eager to accept any reasonable hypothesis, a con-

dition of mind as agreeable as it is uncommon among explorers in distant lands, and it is somewhat humiliating to our nineteenth century archæology that no one has been able to suggest an improvement upon his modestly advanced theory.

Mr. A. L. LEWIS, who has been corresponding with Mr. Bent in reference to the question of orientation raised by Sir J. Evans, writes that Mr. Bent informs him that the orientation of the South African sanctuaries is about 32 degrees south of east, while the sun on the longest day should rise there between 25 and 30 degrees south of east, and that many other interesting mathematical points concerning the structure of the ruins are being worked out and will be of great value. Mr. Lewis adds that the orientation may be rather toward the first appearance of the dawn than of the sun itself, which seems to be the case in some of our own circles. Major Conder in his "Heth and Moab" has said: "The menhir is the emblem of an ancient deity; the circle is a sacred enclosure, without which the Arab still stands with his face to the rising sun;" so that sun worship and phallic worship appear to be associated with circles and with single stones in a country not far from that Arabia to which the people are apparently traced who set up their phallic pillars and menhirs, and placed them in the direction of the rising sun in South Africa.

Miss BUCKLAND said that Baines, who was the first of modern travellers to call attention to these remarkable ruins, had figured stones protruding horizontally from the wall of the hill fortress, as though they had supported a gallery, and upon one of these stones was drawn a lozenge-shaped pattern connected by waved lines resembling the Egyptian hieroglyph for water, and wished to know whether Mr. Bent had found this stone, or any of the inscriptions, which all the old Portuguese travellers mentioned as existing over the gateway.

Miss Buckland thought also that the flora of the country should be taken into account in determining the builders of Zimbabwe, as pioneers of the Chartered company had spoken of passing through miles of wild orange groves, and finding pine apples and other fruits, not supposed to be indigenous to South Africa, growing in profusion; it is also said that in Manicaland alone, south of the Zambesi, is the cotton plant cultivated and woven into cloth, all which seemed to point to Asia as the home of the builders of Zimbabwe, and the numerous similar ruins scattered through so many miles of country inland; but before deciding that Arabia sent forth these skilled workmen, it would seem desirable to know whether similar buildings are to be found in any part of the Arabian peninsula.

In answer to Sir J. Evans' question Mr. BENT gave the measurements and scale of the chief ruins, and stated that the orientation of all the temples is south-east, and in reply to Mr. Charles Read's remarks he gave further instances as regards the initiative and

conservative tendencies of the Abantu races, showing how they have derived their present knowledge of iron smelting and art from a prior civilisation.

As to the fragments of celadon and Persian pottery, the Arabian glass and iron implements, Mr. Bent stated that they were quite on the surface of his excavations, and their value in fixing the date of the ruins would therefore be naturally insignificant.

ANTHROPOLOGICAL MISCELLANEA AND NEW BOOKS.

International Oriental Congress, London, September, 1892.

Section of Anthropology and Mythology.—President, Dr. TYLOR; Foreign President, Prof. DARMESTETER; Secretary, S. ARTHUR STRONG, Esq.; Foreign Secretary, Count ANGELO DE GUBERNATIS.

The following abstract of the proceedings of the Anthropological Section is reprinted by permission of the Editor of the *Times*.

Dr. E. B. TYLOR delivered his Presidential Address, in the course of which he examined the traces of the ancient stone age in the Oriental region, with the view of establishing the basis upon which later and higher stages of civilization were raised. In Europe, as is well known, the rudest stone implements of the so-called palæolithic age, which have carried back man's antiquity to a period of even geological remoteness, belong to the period of the mammoth and the rhinoceros. Such implements are also found in districts at the edge of the Oriental region—viz., Egypt, Syria, and India. What Dr. Tylor dwelt on as especially important is the fact that implements of even a lower type are found in Tasmania, and have there lasted on into the time of Englishmen now living, who have seen and described their making and use by these now unhappily extirpated savages. These implements are ruder in make than those of the mammoth period, inasmuch as their edges are formed by chipping only one surface of the stone instead of both as in the European examples. They were never fastened in any kind of handle, which is proof of itself that it was not by degradation from any higher stage that the Tasmanians reached their present level of rudeness. On the contrary, they adopted the European hatchet as soon as they saw it, and it is inconceivable that having once realised the use of the handle they should at any time have abandoned it to grasp the blade with their hands. In the light of these facts palæolithic man ceases to be a mystery, now that we can see the portraits and examine the life of his modern counterpart. The Tasmanians were rude and simple savages, perhaps the rudest that have ever been seen living in a normal state. With no bow and arrow, no throw-stick like that of their Australian neighbours, they lived a nomad life, content with the rudest shelter of boughs. They nevertheless showed fairly developed mental and moral capacity. Their language was of the agglutinating type, meagre but efficient. Their morals were those of kindness to their friends, passing readily into ferocity when

they were frightened or hurt. Their religion was rude but definite, comprising a clear idea of the human soul, which they called shadow. The shadows of their dead ancestors were their guardian deities. An echo was a "talking shadow." Their highest clearly conceived deity was he of the thunder and lightning. Dr. Tylor then passed from these representatives of the lower stone age to consider their successors of the neolithic period. Its traces reach across from Egypt, where Mr. Petrie's researches have enabled us within the historic period to see flint giving way to copper and bronze tools. At the other side of the world, the South Sea Islanders with their polished adzes are the best known representatives of the stone age. Dr. Tylor, however, laid stress upon the point that they must not be considered stone-age men in an untouched state of nature. They are an example of the fact that even savage life must be closely looked into to see whether it has undergone influence from without. It is plain that Asiatic influences have had their share in shaping South Sea Island life. Kites and jews-harps are the toys of Asiatic nations, but they are found as far as New Zealand, where they may well have been used before the comparatively recent time when they reached England. Especially there is spread over the South Sea Islands a theory of the universe, consisting of an upper world of heavens arranged in stages, with a corresponding lower world on the same plan. Such a theory, quite beyond barbaric invention, can only be considered as borrowed from Asiatics, among whom such theories of heavens and hells, themselves derived from the planet-spheres of Babylonian astronomy, fill Hinduism and Islam. It is probable that in this case the line of transmission should be traced from India across the Malay Peninsula. The paper was illustrated by an exhibition of Tasmanian stone implements.

A vote of thanks to the President was proposed by Count A. de Gubernatis, and seconded by Professor James Darmesteter.

A paper was read by Count Angelo de Gubernatis on "Le Rôle du Mythe dans le Conte Populaire," in the course of which he urged upon the members of the section the importance of forming a systematic collection of Oriental folk-lore, ancient and modern. The paper was followed by a discussion, in which the President, Professor Darmesteter, Professor Tchéraz, and Mr. Hagopian took part, and a proposal was made by the Secretary and adopted by the meeting to the effect that Professor de Gubernatis's suggestion should be accepted, and a provisional committee formed to consider what steps should be taken to carry it into practical effect.

Professor Tchéraz read a paper on "Armenian Mythology."

A paper was read by Professor T. de Lacouperie, "Sur le Coco du Roi de Yueh et l'arbre aux enfants," in which he began by discussing the origin and meaning of the word "coco," and of the legends connected with the cocoanut in the folk-lore of different countries. The conclusion was that the story of the cocoanut of

the King of Yueh represented the primitive form of the legend found in various forms in Albiruni and the Mahabharata of a tree upon which children or diminutive men grow like fruit.

The paper was followed by a discussion, in which the President, Count de Gubernatis, and Professor Tchéraz, took part.

A paper by Signor Girolamo Donati on "Una Tavoletta Augurale Indiana," was read by Count ANGELO DE GUBERNATIS, who presented a photograph of a copper tablet, preserved in the Indian Museum at Florence, containing a series of texts in praise of the god Mangala, which have been translated by Dr. Donati. The author shows that the god Mangala is no other than Karttikeya, and he calls attention to a new case of mythological atavism in the figure of this god of war and nursling of the Pleiades, whom he connected, as well as the god Ganeça (another son of Çiva), with his grandfather Indra and the Maruts.

Professor KOVALEVSKY read a paper on Iranian influences in the Caucasus, which can be traced not only in the survival of names like that of Ormazd, but in certain superstitions connected with the burial of the dead, the character of impurity attaching to the cat, and the magical virtue assigned to the clippings of the nails and hair of human beings.

The paper was followed by a discussion, in which the President, Dr. Gaster, Professor Tchéraz, and Count de Gubernatis took part.

Mr. W. ST. CHAD BOSCAWEN read a paper on "Pictorial Systems of Writing as Evidence of Early Civilization." This paper described the evidence of the important painted hieroglyphic signs from the tombs discovered by Mr. Flinders Petrie at Medum. These signs throw an entirely new light upon the earliest stage of Egyptian civilization, and carry it back into the prehistoric age. The tombs at Medum were the oldest in Egypt, and belonged to the fourth dynasty, of the age of Senefru. The hieroglyphics being beautifully coloured, it was possible to detect the nature of many signs not hitherto identified. The sign for "water" was not derived either from a lake or a river, but from a wave-broken surface. It being coloured black or dark blue seems to indicate its derivation from the sea. In the same manner the "bow," usually called the Libyan bow, here bore so close a resemblance to the archaic Babylonian bow as to be perhaps connected with it. The study of the hieroglyphics of Chaldea in comparison with those from Medum showed both those countries as using stone weapons and tools, wooden sickles with flint teeth being found in Egypt at Kahun corresponding exactly with those in the painted hieroglyphics. In Babylonia, as in Egypt, fire was kindled by the revolving fire-stick. There was evidence from these pictures of roads and canals in Egypt and Chaldea at the earliest times. He then urged the section to study ancient inscriptions of a pictorial nature, which, even if they remained undeciphered, at the same time might become a mine of wealth to the anthropologist.

A paper on "Anthropology in India," by Mr. H. H. Risley, in the absence of the author, was read by the SECRETARY. After a short statement of what had already been done in the way of anthropological investigation in India, he said it was to inquiry in the Punjab and beyond the Punjab frontier that he looked for the results of the highest interest. During the years 1887-8 a small but very interesting series of measurements, extending to only nine tribes and castes, were taken under his supervision by Alá-ud-din, a civil hospital assistant at Lahore. The results appeared to be of the highest interest with reference to recent speculations concerning the origin of the Aryans. They were confirmed to a remarkable extent by some measurements recently taken by himself of a number of Káfirs, Hunzas, and Nagars who were brought down to Calcutta in March last. It was curious to find among these wild tribesmen, who had just been fighting against us at Nilt, confirmation of the statement quoted by Grote ("History of Greece," X., 168, note) from Ritter's Erd-kunde, that "among the inhabitants of Kafiristan there exist traditions respecting Alexander, together with a sort of belief that they themselves are descended from his soldiers." Among the men measured were two Nagar chiefs with fair complexions, light-brown eyes, eyelashes, and moustaches, and limbs of perfect proportions, who looked as if the figures on a Greek vase had by art-magic been endowed with life. They claimed descent from no less a person than Alexander himself, and one of them bore the name of Iskandar Khan. In conclusion, he begged the members of the Congress to bear in mind that the sort of "open-air bureaucracy" by which India is governed, which spends a great part of the year in camp, and has unrivalled opportunities for free personal intercourse with the people, is the finest agency for carrying on anthropological and ethnographic inquiries that it is possible to imagine; that by engaging in such inquiries these officials render themselves more efficient for Government purposes and more popular with the people; and that the knowledge to be acquired in this manner throws the most striking light on the annals of classical antiquity as well as on the earlier phases of primitive human society.

Mr. WILLIAM CROOKE, Bengal Civil Service, read a paper describing the work already done in connexion with ethnographical research in Northern India. At the desire of the Supreme Government, the Government of the North-Western Provinces, who are represented at the Congress by Mr. Crooke, as their delegate, had decided to create an ethnographical board, with the writer of the paper as general director, to initiate a series of inquiries similar to those in progress in Bengal under the supervision of Mr. Risley. The board had already undertaken the classification of the castes according to their habitat, and had selected a staff of inquirers throughout the province to whom a series of questions had been issued. These will ultimately form the basis of an ethnographical handbook for the province. Mr.

Crooke proceeded to give illustrations of what India could do in the way of ethnology and folk-lore. He suggested that the Indian evidence was opposed to the theory which made communistic marriage and polyandry necessary stages in the human marriage. Exogamy, the rules of which would be investigated by the board, was more probably the result of the survival of the fittest than due to a recognition by primitive savages of the evils of interbreeding. He described the general principles on which exogamy was based in India, and went on to the instances of survival in marriage rites of capture, purchase, and exchange. After referring to the parturition-pollution and the couvade, he went on to detail the barrow method of disposal of the dead. He then dealt briefly with the popular rural religion, which is very different to orthodox Hinduism. He described how far the ethnographical survey intended to deal with folk-lore in its two divisions, of folk tales and popular superstitions; and, after detailing the difficulties under which ethnological inquiry was conducted in India, he pleaded for the sympathy and support of the Congress in the survey now in progress.

A discussion followed, in which the President, Mr. Vincent Smith, Mr. Baines, and Mr. Browning took part. Mr. V. Smith made some remarks upon the manners and customs of the Jâts, and recommended the preparation of a monograph upon the subject. Mr. Arnold called the attention of the meeting to a little-known religious sect in India, the Mahâ Mandala Sabhâ, and Mr. Baines contributed some observations upon the folk-lore of the Bhîls.

A proposal was submitted to the meeting by the President, and carried unanimously, "That the Anthropological Section of the Orientalists' Congress desire to express their sense of the political as well as scientific importance of the anthropometric and descriptive information collected under the orders of the Government of Bengal, and note with satisfaction that the Government of the North-West Provinces and Oude has taken steps to promote ethnographic studies within its jurisdiction, and trust that this line of research may receive throughout India the countenance and support of other local governments and administrations. Sufficient interest exists among Indian officials to enable the investigations in question to be carried on without the necessity of applying to Government for a subsidy."

A paper was read by Professor LEUMANN on "Rosaries in Use among the Jains." He cited passages from Prakrit literature, which prove that they must have been in use in India at least as early as the second century B.C. The President exhibited specimens of Vaishnava and Shaiva rosaries, and a discussion followed in which Mr. Pfoundes, Professor Kovalevsky, Mr. Crooke, and Mr. Taw Sein Ko took part. Mr. Pfoundes exhibited diagrams of rosaries of unusual type in use among the Japanese, while Mr. Taw Sein Ko spoke upon the rosaries of Burmah.

A paper on the "Marital Relations of the Nicobar Islanders," in the absence of the author, Mr. E. H. Man, was read by the SECRETARY. The conclusion was that a Nicobarese wife is regarded by her husband in all respects as a helpmeet and equal, who, if she happens to possess any special merit or claim to superiority on account of her personal attractions, skill in household duties, or proficiency in other respects, is usually able to assert her authority without exciting any anger or opposition in her husband, who is far too sensible of his good fortune in having won so excellent a wife to think of risking his happiness and comfort by offering any serious objections to her projects and desires. The following proposal was then made by the President, and carried unanimously:—"That this section desires to call the attention of the Congress to the importance of forming a collection of Oriental folk-lore on a systematic basis by the co-operation of Orientalists in each country."

"**Excavations in Bokerly Dyke and Wansdyke.**" By Lieut.-General Pitt Rivers, F.R.S., vol. iii.—General Pitt Rivers has presented a third of his noble volumes to the Institute, the value of which is enhanced by an excellent likeness of the Author as frontispiece.

The excavations recorded in this volume are of especial interest, as affording data for fixing the period of construction of those great earthworks commonly called Belgic ditches, of which the best known and most extensive is the Wansdyke, which can be traced for a distance of sixty miles from "near the Bristol Channel by Bath, to beyond Savernake Forest, and then turning in the direction of Andover," whilst the second dyke examined, known as Bokerly Dyke, "is about four miles in length, and the two together, though not continuous works, defend the whole south-west promontory of England, including Wilts, Somerset, Dorset, Devonshire, Cornwall, and a part of Hants, from an attack from the north and east," supplying evidence, as General Pitt Rivers believes, of "a great war, in which the whole of the south-western portion of the country was arrayed against the rest of Britain," and referring to some missing page of English history.

These great earthworks have hitherto been regarded by antiquaries as of pre-Roman and Belgic origin, but the excavations of General Pitt Rivers have proved conclusively that "both works, at the places where I excavated them, are Roman or post-Roman. The Belgic theory has been completely overturned, and although the question of a Romano-British or Saxon origin is still open for future enquiry, some probabilities only pointing towards the former hypothesis, no reasonable man can ever again assert that either of these dykes, at the spots where I examined them, are pre-Roman, or that the Bokerly Dyke was erected previously to the time of the Emperor Honorius, that is to say, previously to the time when the Roman legions evacuated Britain."

Such being the conclusions arrived at, let us examine succinctly the facts upon which these conclusions are based.

These are chiefly the coins and other relics found in the body of the rampart, and which must therefore have been in the soil when it was thrown up in the construction of the work, being found chiefly near the old surface line. The coins found at Bokerly range from Valerian to Honorius, with one of Hadrian and two of Marcus Aurelius; by far the larger number belonging to the period between A.D. 306–361, including the reigns of the Roman Emperors from Constantius I. to Julian II. This period is represented by 593 coins out of a total of 1,210, whilst two only of Honorius were found.

This abundance of Roman coins, and also of Roman and Samian pottery, with other relics, undoubtedly Roman or Romano-British, seem to point to the prior existence of a Romano-British settlement near the portion of Bokerly Dyke excavated, and this settlement General Pitt Rivers has discovered by trenching at Woodyates, identifying it with the Vindogladia of the Itinerary of Antoninus, which was twelve Roman miles from Sorbiodunum, almost the exact distance of this newly discovered settlement.

The remains found at Woodyates seem to tally pretty closely with those of the other Romano-British villages excavated by General Pitt Rivers: amongst them may be mentioned a hypocaust like those at Woodcuts. An elaborate system of drainage existed, but like the refuse pits at Woodcuts and Rotherley, the drains had been filled up and used as places of sepulture; the skeletons found there having been buried both in extended and crouching positions, the stature being generally small, although averaging a little higher than those at Rotherley, and the skulls dolichocephalic, although there is evidence of an admixture probably with the Romans, in two brachycephalic and nine medium skulls.

Bokerly Dyke, which now serves as a boundary between Wilts and Dorset, was evidently a defensive work, although there would seem to have been many gaps in it, which, however, General Pitt Rivers thinks were filled by almost impenetrable forests which might have been fortified by an abattis of felled trees. That portion of Vindogladia excavated by General Pitt Rivers lies to the north of the ditch, and therefore could not have been defended by it, but he thinks the main body of the settlement will probably be found to the south of the Dyke, between it and the present village of Woodyates, the earthwork having been thrown up as a defence against an enemy approaching from the east, perhaps the Saxons.

Two ditches, one behind the other, have been traced for a considerable distance, the one to the rear being evidently much older than the other, having apparently been filled up when the second was dug.

The date of the earlier ditch is not conclusively proved. "Two hundred and sixty feet of rampart," says General Pitt Rivers, "was dug on the south-east of the Epaulement, without finding anything Roman except some dubious pieces of pottery quite near the surface. The bulk of the pottery was of a kind that might be attributed to the British as well as the Roman Age. This goes a long

way towards proving that the Dyke to the south-east of the Epaulement was earlier, and that the extension of it to the north-west was made in Roman or post Roman times, but it is not conclusive. This spot is more distant from the settlement than Sections 1 and 2. Whatever kind of pottery exists in the soil will be thrown up into the rampart, and at whatever period a rampart may be made, it will disclose only such kinds of pottery as the soil contained, or such as might have been accidentally dropped into it during its construction. The absence of Roman pottery is, consequently, no proof that a rampart is earlier than the Roman times, though it may leave the question of date open." It is important to bear this in mind, for in the excavations at the Wansdyke near Devizes, there was a remarkable absence of Roman coins, although red Samian ware was found on the old surface, which must therefore have been there before the erection of the rampart, and also an iron cleat, used for fastening sandals, similar to others found in Bokerly and at Rotherley.

Of this great entrenchment, rivalling in extent the wall of Hadrian in the north, and being, like that well-known work, strengthened at intervals by camps or fortifications, General Pitt Rivers says that "although its Roman or post-Roman origin has been satisfactorily determined," still the absence of coins renders it difficult to determine the precise date of its erection, and it may have been raised after the expedition of Aulus Plautius, in A.D. 43, or during the troubles in A.D. 208, when the Emperor Severus was obliged himself to check the inroad of the Caledonians, or by the Romanised Britons, "as a defence against the Picts and Scots, when the Britons were driven into the south-west corner of the country, whilst Bokerly, at a somewhat different time, may have served to protect them against the Saxons," or both works may have been thrown up by the Saxons; but General Pitt Rivers rejects the last supposition, on the ground that if erected by the Saxons it would have been mentioned by some of the Saxon chroniclers, and the name Wansdyke, supposed to signify Woden's Dyke, would hardly have been given to it by the Saxons. To this I may, perhaps, be allowed to add as another reason, the absence of all Saxon relics, which certainly must have been found in some part of the work had the erectors been Saxon, whereas, as far as I can judge, all the relics exhumed belong to the Britons, Romans, or Romanized Britons. The number of these relics, however, is not great, as compared with those found at Bokerly and Woodyates, consisting almost entirely of pottery, an iron cleat, knife, and nails. Amongst the pottery red Samian ware of excellent quality was found, with various coarser kinds, perhaps British, and some described as nondescript, resembling that of the bronze age.

Here, too, as at Bokerly, there are traces of an earlier entrenchment, the outer bank of the Wansdyke having been thrown over it in one part, whilst a curve is made in the formation of the dyke, apparently in order to avoid the destruction of this older work. Although General Pitt Rivers assigns both the entrenchment and

the Wansdyke to Roman or post-Roman times, it is very evident that a portion at least is older than the Bokerly Dyke, and it is to be hoped that General Pitt Rivers will extend his excavations to some other part of this great defensive work, so as to be able to assign a definite period for its construction; and, if he could be persuaded to include the vast and mysterious monuments of Avebury and Stonehenge in his investigations, archæologists would owe him a still deeper debt of gratitude.

It is impossible in a short notice to mention all the points of interest in this splendid volume, but I must call attention to the skulls found at Bokerly, as described and measured by Dr. Garson, and to some others, figured, from Hunsbury Camp, Northampton, one of which is remarkable from having three singular perforations in a triangle on the vertex. These holes were apparently cut after death, for what reason is not easily determined. If made for trephining during life, the patient must have died under the operation, but the portions cut out seem too small to have been abstracted for amulets. Very similar holes, varying from a third to half an inch in diameter, have been found in some American skulls, and are supposed to have been used for the purpose of suspension, although Mr. Gilman "found in a mound, at Devil River, Michigan, the remains of a person, evidently of rank, lying upon his back, but with the characteristic perforation in his skull."[1] The Hunsbury skulls are referred to the late Celtic period.

The maps, plans, and relic tables which accompany this work render it most valuable to students, and show the minute, and it may be said *affectionate* care bestowed upon these excavations by the Author.—[A. W. B.]

Bark Cloth of Uganda.

(Reprinted from the Kew Bulletin (2·63) *by permission of H.M. Stationery Office.)*

One of the most interesting of recent additions to the Museums of Economic Botany at Kew has recently been received from Sir John Kirk, G.C.M.G. It consists of a large sheet of bark cloth prepared by the natives of Uganda from the inner bark of a species of *Brachystegia*, a small genus of trees belonging to the *Cæsalpinieæ* sub-order of the natural order *Leguminosæ*. The specimen is about 14 feet 6 inches long, 7 feet broad, and $\frac{1}{16}$ of an inch in thickness, and is of a reddish-brown colour, somewhat lighter on the under side, and is slightly crimped, probably the result of having been beaten out with grooved clubs.

The genus *Brachystegia* is confined to tropical Africa, and seems to be generally used by the natives as a source of bark cloth. Messrs. Speke and Grant in their expedition to the sources of the Nile, 1860–1863, made some interesting notes on the preparation and uses of cloth from this source, which it may be well to add.

[1] Dr. Fletcher on "Perforated American Crania," "Contributions to American Ethnology," vol. v, p. 25.

They say of *Brachystegia spicæformis*, Benth., that it is a light graceful tree of 20 to 40 feet high, common in rich forest, and is known in the Robeho Mountains, Zanzibar, under the name of "M'chenga" or "M'nenga," the bark of which is made into kilts, cloths, band-boxes, huge grain stores, matches, roofing for camp huts, &c.; they also add that a blood-red juice exudes on cutting the bark. These same explorers collected slight herbarium material at Keegwah in lat. 5° 5′ S. of what is so far determined as *Brachystegia tamarindoides*, Welw. var.? With the following note—"Native name 'Mecombo,' a first-class tree, as it has so many uses. Tree 50 feet high, long naked trunk 9 feet in circumference. Foliage deep green. The wood is considered good for building. Its bark after being boiled and prepared is made into white sheets or cloths worn by the natives at 10° S. They also make canoes, boxes, matches, and ropes from it. Its honey is considered very superior in flavour and whiteness. First met with 30 miles from the sea; afterwards in the interior it was frequent. It is so plentiful at 6° S. lat. that our temporary huts were roofed with its bark, and my plants were protected by planks of its bark, which answered admirably, being light and stiff."

During Livingstone's Zambesi expedition in 1860, Sir John Kirk collected specimens of *Brachystegia appendiculata*, Benth., a tree of 20 to 40 feet high in the highlands of the Batoka country, where it is known under the name of "Motondo" (Setoka), the seeds being eaten by the natives; he also collected the same species near Muata Manja, 14° 19′ S. lat., and states that the fibrous bark is made into cloth by being beaten out. According to Dr. Meller this tree is known as "Chenga" near Zomba. The herbarium contains a specimen of *Brachystegia longifolia*, Benth., collected by Mr. J. Buchanan in the Shire highlands, and bears the following label—"Njombo. Bark cloth tree, wood very soft." Another herbarium specimen collected by Sir John Kirk near Kusuma, on the river Shire is labelled *Brachystegia, sp. nov.*, and is described as being a good-sized tree with a fibrous bark which is used for cloth.

Since the above was written a report has been received through Sir John Kirk from Captain Lugard, the officer now commanding the Imperial British East Africa Company's troops in Uganda, in which the following reference is made to the bark cloth so extensively in use there of which the specimen now in the Kew Museum is an example.

Captain Lugard says, "The fig class [*Ficus*] is largely represented in Uganda, where they are cultivated for the sake of their bark from which the native cloth is made." Thus, although there can be no doubt that the cloth bark used in Nyassaland and much of that used elsewhere, is derived from various species of *Brachystegia*, the subject requires further investigation, and it is most desirable that those in a position to investigate the question on the spot should send the leaf *at least* of the tree which they have seen used to yield the bark cloth with specimens of the cloth itself.

"**The Relations of Mind and Brain.**" By Henry Calderwood, LL.D., Professor of Moral Philosophy, University of Edinburgh. 3rd edition. (Macmillan, 1892.) 8vo. pp. 551. The object of the work, as stated in the preface to the first edition, is to ascertain what theory of mental life is warranted on strictly scientific evidence. The order followed is to consider, *first*, the latest results of anatomical and physiological research as to the structure and functions of the brain; *second*, the facts in human life unaccounted for by anatomical and physiological science, and requiring to be assigned to a higher nature. On the side of Mental Philosophy, it must be recognised that analysis of consciousness cannot be regarded as affording a complete survey of the facts of personal life. On the other hand, it is clear that the known facts connected with cerebral action do not include familiar phases of mental activity. If we allow ourselves to be engrossed with physiological investigations as to brain, we restrict our attention to a single class of facts, and become unable to take a view of human life as a totality. The whole range of evidence must be traversed, if we are to secure a harmonious representation of the constitution of human nature. The titles of the chapters are:—Relations of philosophy and science; structure of the brain; the nerve system as dependent on the great nerve centre; localisation of functions in distinct portions of the brain; comparison of the structure and functions of brain in lower and higher forms of animal life; results of anatomical and physiological investigations; animal intelligence; personal experience as connected with action of the sensory system; experience as connected with motor activity; retention of acquisition-memory; use of speech; action and reaction of body and mind; weariness, sleep, and unconsciousness; brain disorders; the higher forms of mental activity; summary of intellectual results; hypnotism. The work is fully illustrated and well indexed.

"**The Ainu of Japan.**" By John Batchelor. (R.T.S., 1892.) 8vo. pp. 336. The volume, written by a missionary, originally in the form of letters, contains a large amount of information with regard to the habits and customs of the Ainus. Some of the subjects dealt with are their ornaments, religious symbols, government, ghosts and future life, polytheism, prehistoric times and legends. The work contains eighty illustrations, and is fully indexed.

"**Masks, Heads, and Faces,**" with some considerations respecting the rise and development of art. By Ellen R. Emerson. (A. and C. Black, 1892.) 8vo. pp. 312. The authoress considers that "The original purposes of the mask were religious and serious. Their object, like the earliest form of the drama, was the manifestation—the incarnation—of the gods. Rite and formula carefully guarded them; reverence for their indwelling 'breath,' animating both mask and wearer, preserved them. Not

until a late period of advanced civilisation in Europe were they deemed unfit for religious spectacle." The work is profusely illustrated.

"On the Modification of Organisms." By David Syme. (Kegan Paul.) 8vo. pp. 164. The scope of the work is defined by the author at the commencement of the first chapter: "After a review of all that has been said for and against natural selection during the last thirty years, Dr. Wallace expresses himself, in his recent work on Darwinism, as having come to the conclusion that this principle 'is supreme to an extent that even Darwin himself hesitated to claim for it.' Notwithstanding the opinion of this high authority, I venture to think there is something to be said on the other side of the question, and I propose in the following pages to show that the acceptance of this theory is still beset with difficulties of a very formidable character. . . . (p. 15). We have seen that Darwin's language is wanting in precision, and his definitions and theories are variable and contradictory. In one place natural selection is the 'struggle for existence'; in another, the 'struggle for existence' is said to bear on 'natural selection'; in a third place he speaks of the 'struggle for existence and natural selection' as if they were independent principles. . . ." The titles of the chapters are: the province of natural selection; the effects of natural selection; the extermination of the unfit; sexual selection; the fertilisation of plants by insects; the causes of variability; the modifying agency.

"Vocabularies of the Tlingit, Haida, and Tsimshian Languages." By Dr. Franz Boas. (Proc. Amer. Philos. Soc., vol. xxix.) 8vo. pp. 35. The vocabularies were collected by the author while studying the Indian tribes of British Columbia under an appointment of the Committee of the British Association.

"The Origin of Metallic Currency and Weight Standards." By William Ridgeway, M.A. (Cambridge, at the University Press, 1892.) 8vo. pp. 417. The work deals very fully with the origin of metallic currency, &c., under the following headings:—The ox and the talent in Homer; primitive systems of currency; the distribution of the ox and the distribution of gold; primæval trade routes; the art of weighing was first employed for gold; the gold unit everywhere the value of a cow; the weight systems of China and Further Asia; how were primitive weight units fixed? statement and criticism of the old doctrines; the systems of Egypt, Babylon, and Palestine; the Lydian and Persian systems; the Greek, Sicilian, Italian, and Roman systems. The author (p. 387) concludes as follows:—"It now simply remains to sum up the results of our enquiry. Starting with the Homeric poems, we found that although certain pieces of gold called *talents* were in circulation among the early Greeks, yet all values were still expressed in terms of cows. We then found that

the gold *talent* was nothing else than the equivalent of the cow, the older unit of barter; and we found that the *talent* was the same unit as that known in historical times under the names of Euboic stater or Attic stater, and commonly described by metrologists as the light Babylonian shekel. Our next stage was to enquire into the systems of currency used by primitive peoples in both ancient and modern times, and everywhere alike we found systems closely analogous to that depicted in the Homeric poems, and we found that in the regions of Asia, Europe, and Africa, where the system of weight standards which has given birth to all the systems of modern Europe, had its orign, the cow was universally the chief unit of barter. Furthermore, gold was distributed with great impartiality over the same area, and known and employed for purposes of decoration from an early period by the various races which inhabited it. We then found that practically all over that area there was but one unit for gold, and that unit was the same weight as the Homeric Talanton. Next we proved that gold was the first object for which mankind employed the art of weighing, and we then found that over the area in question there was strong evidence to show that everywhere, from India to the shores of the Atlantic, the cow originally had the same value as the universally distributed gold unit. From this we drew the conclusion that the gold unit, which was certainly later in date than the employment of the cow as a unit of value, was based on the latter; and finally we showed that man everywhere made his earliest essays in weighing by means of the seeds of plants, which nature had placed ready to his hands as counters and as weights. Then we surveyed the theories which derive all weight standards from the scientific investigations of the Chaldeans or Egyptians, and having found that they were directly in contradiction to the facts of both ancient history and modern researches into the systems of primitive peoples, we concluded that the theories of Boeckh and his school must be abandoned. Next we proceeded to explain the development of the various systems of antiquity from our ox-unit, taking in turn the Egyptian, Assyrio-Babylonian, Hebrew, Lydian, Greek, and Italian. New explanations of the origin of the Talent and Mina, and also of the earlier types on Greek coins, and of the varieties of standard employed for silver by the Greeks were offered; and, finally, in dealing with the systems of Sicily and Italy arguments were advanced to show that the Roman *As* was originally nothing more than a rod or bar of copper of definite measurements, and was in weight and method of division the same as the Sicilian Litra and the Greek Obol." The work is well illustrated, and there is a full index.

"**Russian Characteristics,**" reprinted with revisions from the "Fortnightly Review." By E. B. Lanin. (Chapman and Hall, 1892.) 8vo. pp. 604. This important work deals with the following points, on which the author has endeavoured to supply

data for enabling the reader to gauge the workings and tendency of Russian autocracy :—The demoralization of the nation. Truthfulness and the mythopæic faculty. The life philosophy of the Russian. Fatalism, improvidence, and hospitality. Procrastination ; time not money. Shiftlessness of the people ; grandmotherly legislation. Honesty tempered by communism. The ethics of commerce. Prisons. Armenia and the Armenian people. Sexual morality. Finance ; the racking of the peasantry. Finland. The Jews in Russia. The famine. The author quotes authorities for his statements very fully, and the whole volume forms a serious indictment of the Russian official system, and of private morality.

"**The Land Systems of British India,**" being a manual of the land tenures and of the systems of land revenue administration prevalent in the several provinces. By B. H. Baden-Powell, C.I.E. (Oxford, at the Clarendon Press, 1892.) 3 vols. 8vo. pp. 2102. With maps. The work deals exhaustively with the subject, and will be indispensable to everyone studying the points referred to.

"**Legends and Popular Tales of the Basque People.**" By Mariana Monteiro. (T. Fisher Unwin, 1890.) 8vo. pp. 274. The tales given form a valuable addition to our knowledge of the Basque people. A short glossary is also given.

"**Studies in South American Native Languages," from MSS., and other rare Printed Sources.**" By Daniel G. Brinton. (Philadelphia, MacCalla, 1892.) 8vo. pp. 87. The Tacana language and its dialects, the Jivaro, Cholona, and Leca languages, a text in the Manao dialect, the Bonari dialect of the Carib stock, the Hongote language and the Patagonian dialects, the dialects and affinities of the Kechua language, affinities of South and North American languages, the dialects of the Betoyas and Tucanos. The Chinantec and Mazatec languages of Mexico.

"**Catalogue of Prehistoric Works," East of the Rocky Mountains.** By Cyrus Thomas. (Smithsonian Institution, 1891.) 8vo. pp. 246. Map.

"**Omaha and Ponka Letters.**" By J. O. Dorsey. (Smithsonian Institution, 1891.) 8vo. pp. 127. A special alphabet is used and translations are given.

"**Anthropology, as a Science, and as a Branch of University Education.**" By D. G. Brinton. (Philadelphia, 1892.) 8vo. pp. 15. The object of the pamphlet is to suggest a general scheme for instruction in Anthropology.

"**Har-Moad, or the Mountain of the Assembly, a Series of Archæological Studies chiefly from the standpoint of the Cuneiform Inscriptions.**" By O. D. Miller, D.D. (Stephen Whipple, North Adams, Mass., 1892.) 8vo. pp. 445. The author deals with the subject largely from a theological point of view.

"Bibliography of the Algonquian Languages." By J. S Pilling. (Smithsonian Institution, 1892.) 8vo. pp. 614. The volume deals with 107 languages and is illustrated with 82 fac-similes. "The Algonquian speaking peoples covered a greater extent of country, perhaps, than those of any other of the linguistic stocks of North America, stretching from Labrador to the Rocky Mountains, and from the Churchill River of Hudson Bay to Pamlico Sound in North Carolina; and the literature of their languages is by far the greatest in extent of any of the stocks north of Mexico, being equalled, if at all, by only one south of that line, namely, the Nahuatl."

"Property: its Origin and Development." By Ch. Letourneau, Professor in the School of Anthropology, Paris. (Walter Scott, 1892.) 8vo. pp. 401. The author deals with the subject very fully under the following headings: property among animals, among primitive hordes and tribes, among republican tribes, among monarchic tribes; collective property in Malaysia; property in great barbarous monarchies, in ancient Egypt and in Abyssinia, in China, Japan, and the Indo-Chinese States; among the Berbers, Semites, and Aryans of Asia; in ancient Greece and Rome, in barbarous Europe and under the Feudal system. Inheritance, commerce, debts, and money. The past and future of property. The volume is well indexed.

"The Southern Chins" (Essay on the Language of). By Bernard Houghton, C.S. (Government Printing Office, Rangoon, 1892.) pp. 131 and xx. The work contains valuable anthropological information.

"Siyin Dialect," spoken in the Northern Chin Hills (Manual of). By Captain F. M. Rundall. (Government Printing Office, Rangoon, 1891.) 8vo. pp. 47.

"Haka or Baungshe Dialect" of the Chin Language (Handbook of). By D. J. C. Macnab, B.Sc. (Government Printing Office, Rangoon, 1891.) 8vo. pp. 52.

"The Mide Wiwin," or Grand Medicine Society of the Ojibwa. By W. J. Hoffman. (Washington, Bureau of Ethnology, 1891.) 4to. pp. 152. This extract from the seventh annual report contains a full account of the initiation into the Society, with sixty-one illustrations.

"Monuments primitifs des Iles Baléares." By Emile Cartailhac. (Toulouse, E. Privat, 1892.) 4to. pp. 80. A valuable work, published under the authority of the Minister of Public Instruction, containing 80 plans with 51 photogravure plates $9\frac{1}{4}$ ins. by $6\frac{3}{4}$ ins.

"Is Man too Prolific?" By H. S. Pomeroy, M.D., Leipsic. (Funk and Wagnalls, New York, 1891.) 8vo. pp. 64. The brochure is an answer to the Malthusian doctrine and designed to allay the

fears of those who are troubled about the over-population of the world. The author claims that food is increasing more rapidly than mouths, and the most important factor in the national family and individual weal is that the largest possible number of children should be born.

"Studies in Psychology." By S. G. Burney, D.D., LL.D., Professor of Systematic Theology in Cumberland University, Nashville, U.S.A. (Cumb. Presb. Pub. House, Nashville, Tenn., 1890.) 8vo. pp. 535. The author states in the preface: "The more prominent points in which this work radically differs from other works largely accepted as high authority and extensively used as text-books are as follows:—This work endeavours to avoid the perplexity necessarily arising from the very common vice of formally accepting any given analysis of the mind, and then practically disregarding that analysis in attributing to one faculty the functions of another. . . . It also reprobates as false and necessarily perplexing the almost universally accepted doctrine of composite or complex faculties, complex feelings, and complex action. . . . Another characteristic is its rejection of the generally accepted doctrine that consciousness is a cognitive power of the mind. It alleges, on the contrary, that if the Kantian analysis is accepted as true and complete, consciousness must be relegated to the sphere of the sensibility and regarded as a form or species of feeling. It also rejects as untrue and perplexing the conceits of a 'voluntary consciousness,' &c., exercised over the mind by unknown objects. . . . It also rejects the objectivity of time, space, beauty, and sublimity in the form in which these phenomena are generally stated. It differs somewhat from the more common theories concerning identity, also concerning memory and the laws of association or mental suggestion. The doctrine of the sensibility is only briefly discussed."

"Evolution in Science, Philosophy, and Art. Popular Lectures and Discussions before the Brooklyn Ethical Association." (New York, Appleton and Co., 1891.) 8vo. pp. 475. The volume contains the following lectures:—A. R. Wallace, by E. D. Cope; E. Haeckel, by T. B. Wakeman. The scientific method, by F. E. Abbot. Herbert Spencer's synthetic philosophy, by B. F. Underwood. The evolution of chemistry, by R. G. Eccles. The evolution of electric and magnetic physics, by A. E. Kennelly. The evolution of botany, by F. J. Wulling. The evolution of geology by J. C. Kimball. Form and colour in nature, by W. Potts. The evolution of optics, by L. A. W. Alleman. The evolution of art, by J. A. Taylor. The evolution of architecture, by J. W. Chadwick. The evolution of sculpture, by T. Davidson. The evolution of painting, by F. P. Rundell. The evolution of music, by Z. S. Sampson. Life as a fine art, by L. G. Janes. The doctrine of evolution: its scope and influence, by J. Fiske. Before each lecture a valuable list of "Collateral readings suggested" is given, and the work is well indexed.

"**The Hibbert Lectures, 1891.**" Lectures on the origin and growth of the conception of God; as illustrated by anthropology and history. By Count Goblet D'Alviella, Professor of the History of Religions at the University of Brussels. (Williams and Norgate, 1892.) 8vo. pp. 296. The titles of the lectures are: On methods of research into the prehistoric manifestations of religion. The genesis of the idea of God. Polydemonism and polytheism. Dualism. Monotheism. The future of worship as deduced from its past.

"**Christian Anthropology.**" By John Thein. (New York, Benziger Brothers, 1892.) 8vo. pp. 576. The author, a priest of the Roman Catholic Church, thus defines the object of the work: "Christian Anthropology embraces the entire man, the soul as well as the body. It notes the great difference between man and beast; it considers his intellectual and moral qualities as well as his anatomical and physiological characters, and therefore man's origin, nature, place in creation, antiquity, unity, immortality, future life." The titles of the chapters are: Origin of life and its development; Darwinism and monism; origin of man; man and beast; the state of primitive man; the antiquity of man and Biblical chronology; the antiquity of man and geology; the antiquity of man and the chronologies of India, China, Egypt, and Chaldea; the unity of the human species; specific unity of mankind; the Deluge and the traditions of mankind; geology and the Deluge; causes of the Deluge; answers to objections; man's component elements; the existence of the soul; the immortality of the soul and its future life. The volume may be taken as a text-book of the views of the Roman Catholic Church on the science of Anthropology.

The Universality of Man's Appearance and Primitive Man. By E. L. Anderson. (Edinburgh, D. Douglas, 1891.) pp. 28.

Sacred Books of the East. The GṚihya-sûtras, rules of Vedic domestic ceremonies, translated by H. Oldenberg. Part 2. (At the Clarendon Press, 1892.) 8vo. pp. 376.

"**Sea Phantoms; or, Legends and Superstitions of the Sea and of Sailors.**" By F. S. Bassett. (Chicago, Morrill and Co., 1892.) 8vo. pp. 505. The work deals fully with a large number of sailors' folk-tales and customs. It is well indexed and illustrated.

"**Sex and Life.**" By E. F. Brown, M.D. (Chicago, Schulte and Co., 1891.) 8vo. pp. 142. The work deals in a popular manner with the physiology and hygiene of the sexual organisation.

"**Ideale Welten in Wort und Bild.**" Von A. Bastian. 3 vols. (Berlin, Felber, 1892.) These volumes of anthropological

notes by the Director of the Museum of Ethnology at Berlin are based on investigations during his journeys in India, made for the purpose of adding to the magnificent collections under his charge. The ideal worlds of the title are those imagined in the Hindoo cosmogonies and theogonies, especially among the Jains, whose sacred books are as yet so imperfectly known to students in comparison with those of the Brahmans and Buddhists. The voluminous citations of these volumes are hardly adapted to the reviewer's treatment; but a good idea of Professor Bastian's scope and purpose may be gained from inspection of the illustrations, with reference to the explanations and related documents in the body of the work. In the first volume we have the detailed plan and explanation of the Brahmanic universe, with its multifarious heavens and hells, followed by a Buddhist universe, and again by the Jain system—all obviously related in origin, though worked out into variety. The representations of the central mount, Meru, and of the Jambu tree, belonging to the latter system, are remarkable. The frontispiece represents the mountain of Samet Sikhara, the sacred pilgrimage resort of the Jains, who approach it nowadays by the railway train shown at the foot of the picture. In vol. ii are episodes of the divine history. Mahavira (Bhagavân) receives the homage of the elephant and snake, and Gantama is being converted to his doctrine. Mahavira is suffering the nailing of his ear by the cowherd, and is afterwards cured of his injuries. The Jain hells exhibit their various tortures, as pendants to which Professor Bastian introduces the circles of the Inferno. Not the least curious pictures are those of the world as Biblically conceived by an Evangelical pastor named Frisch, whose book was printed in 1747, with diagrams of the most solid of firmaments. In vol. iii, the diagram of the elemental destructions of the world is to be noticed. In view of the bearing of the study of Jainism on that of the other religions of India, the documents recorded here respecting it by a writer of such wide-reaching comparative knowledge may be expected to promote the solution of the intricate problems involved.—[E. B. T.]

"**The Ulu; or, Woman's Knife of the Eskimo.**" By Otis T. Mason. (Smithsonian Institution, 1892.) 8vo. (20 plates.)

"**La Bijouterie Caucasienne,**" de l'époque Scytho-Byzantine, by E. Chantre. (Anthropological Society of Lyons, July 2nd, 1892.) The paper is very fully illustrated.

"**L'Anthropologie,**" vol. iii, No. 1. Memoir of A. de Quatrefages, with list of his works. Notes on the filling up of caves, by Marcellin Boule, with plates. General considerations with regard to the connection between various anthropological characteristics, by Dr. Collignon. The ethnological position of the people of Ferghanah, by Paul Gault, with plan. No. 2. The ancient monuments of the Kiams in Annam and Tonquin, by Ch. Lemire. The Tjames ruins of the province of Quang-Nam (Tourane), by M. C.

Paris. Skulls from the Phœnician necropolis of Mahédia (Tunis), by R. Collignon. No. 3. Tertiary primates and fossil man in South America, by Dr. E. Trouessart. Skulls of educated persons as compared with those of peasants. Notre Dame de Londres (Hérault), by G. de la Pouge.

"The American Anthropologist," vol. v, No. 1. Siouan Onomatopes, by J. O. Dorsey. A few Tusayan pictographs, by J. W. Fewkes. Aboriginal geographic names in the State of Washington, by M. Eells. Notes on the Chemakum language, by Franz Boas. Dances of the Hupa Indians, by C. E. Woodruff. Improved Cherokee alphabets, by J. Mooney. A Kiowa Mescal rattle, by J. Mooney. Studies in aboriginal decorative art, by W. H. Holmes. Quarterly bibliography. No. 2. The Lâ-lâ-kōn-ta, a Tusayan dance, by J. W. Fewkes and J. G. Owens. Legend of the founding of the Iroquois league, by J. B. N. Hewitt. Studies in aboriginal decorative art, by W. H. Holmes. Early Blackfoot history, by G. B. Grinell. Materials, apparatus, and processes of the aboriginal lapidary, by J. D. M'Guire. Quarterly bibliography. No. 3. The law of torture; a study in the evolution of law, by J. C. Welling. The Mamzraú-ti; a Tusayan Ceremony, by J. W. Fewkes and A. M. Stephen. The nomenclature and teaching of anthropology, by D. G. Brinton. The Villard-Bandelier South American Expedition, by F. H. Cushing. Bibliography.

"The American Antiquarian," vol. xiv, No. 2. The mound builders and the mastodon, by S. D. Peet, illustrated. New discoveries in Tennessee, by G. P. Thurston. No. 3. The cliff dwellings of the cañons of the Mesa Verde, by W. Birstall, illustrated. Pre-Columbian discovery of America, by J. P. MacLean. The "Old fort" of Saline county, Missouri, by T. H. Lewis. No. 4. The pre-Columbian discovery of America, by J. P. MacLean. Idols and images, by S. D. Peet. The ancient inscription at Chatoto, Tennessee, by A. L. Rawson.

"Revue Mensuelle de l'Ecole d'Anthropologie de Paris," vol. ii, No. 1. Poisoned arrows from Sarro (Upper Niger), by J. Laborde. Division between the palæolithic and neolithic periods, by P. Salmon. No. 2. Prehistoric summary, by G. de Mortillet. No. 3. The races, peoples, and languages of Africa, by A. Lefèvre. The cephalic index in France during the neolithic period, by G. Hervé. No. 5. Course of prehistoric anthropology. No. 7. Course of ethnology. No. 8. The origin of literature, by C. Letourneau. The skulls of l'Aveyron, by Ab. Hovelacque and G. Hervé. The human skeleton of Gravenoire, by F. Pommerol.

"Archæological Journal," No. 193. Prehistoric stonework of Mexico, by O. H. Howarth. Some flints from Egypt of the Fourth dynasty, and notes on early sickles, by F. C. J. Spurrell.

"The Journal of the Royal Society of Antiquaries of

Ireland," vol. ii, Part 1. Old place-names and surnames, by Miss Hickson. An urn burial on the site of Monasterboice, county Louth, by Rev. L. Hasse. On a newly-discovered site for worked flints in the county of Down, by W. H. Patterson. Part 2. On two rare stone implements found at Lough Gur, county Limerick, by J. F. M. ffrench. Recent finds in the county Antrim, by W. J. Knowles.

"The Journal of Mental Science," April, 1892, contains a review of several important works on criminal anthropology, by Havelock Ellis.

"Folk-Lore," vol. iii, No. 1. The Lai of Eliduc and the Märchen of little Snow-White, by A. Nutt. Magic songs of the Finns (4), by Hon. J. Abercromby. Guardian spirits of wells and lochs, by Rev. W. Gregor. Manx folk-lore and superstitions (2), by Professor J. Rhys. Folk-lore tales of Central Africa, by Rev. D. Elmslie. No. 2. The sin-eater, by E. S. Hartland. Samoan tales (2), by Hon. J. Abercromby. Divination among the Malagasy, by Rev. J. Sibree. "First-foot" in the British Isles, by Professor Rhys and T. W. E. Higgens.

"Lancet," August 13th. The place of anthropology in medical education, by Havelock Ellis, L.S.A.

"Journal of the Asiatic Society of Bengal," vol. lx. Part I. No. 2. Report on the Boria or Lakha Medi Stúpa, near Junagadh, by H. Cousens. Notes on some Kolarian tribes, by W. H. P. Driver. Place-names and river-names in the Darjiling district and Sikhim, by L. A. Waddell. Vol. lxi, Part I, No. 1. Lamaic rosaries, by L. A. Waddell.

"The Journal of the Anthropological Society of Bombay," Vol. ii, No. 7. On the funeral ceremonies of the Parsees: their origin and explanation, by J. J. Modi. On the use of turmeric in Hindoo ceremonial, by W. Dymock. Vatsyayana on the duties of a Hindoo wife, by P. Peterson. On the use of Ganja and Bhang in the East as narcotics, by W. Dymock. Tables of caste measurements.

"Journal of the Ceylon Branch of the Royal Asiatic Society," vol. xii. A history of the ancient industries of Ceylon, by G. Wall. A contribution to Sinhalese plant lore, by W. A. de Silva.

"The Scottish Geographical Magazine," vol. viii, No. °. The migrations of the races of men considered historically, by James Bryce.

"Transactions of the Royal Society of Canada." (29th May, 1891.) The Beothiks or Red Indians of Newfoundland, by Rev. G. Patterson.

"Science," July 22nd, 1892. Key to the Maya Hieroglyphs, by Cyrus Thomas. Illustrated.

The Index to the whole of the publications 1844–1891 will be issued free to Fellows shortly, in paper covers. Fellows wishing for the same in cloth boards are requested to forward 1*s.* to the Assistant Secretary. Price to non-Fellows, 10*s.*